BMJ Open

# Evaluating the Effectiveness of Unconscious Racial Bias Training for NHS Senior Practitioners to Improve the Experiences of Black, Asian and Minority Ethnic Students



| | |
|---|---|
| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2022-068819 |
| Article Type: | Original research |
| Date Submitted by the Author: | 30-Sep-2022 |
| Complete List of Authors: | Pennington, Charlotte; Aston University<br>Bliss, Eleanore; University of the West of England<br>Airey, Alisha; University of the West of England<br>Bancroft, Mandy; University of the West of England<br>Pryce-Miller, Maxine; Coventry University |
| Keywords: | EDUCATION & TRAINING (see Medical Education & Training), GENERAL MEDICINE (see Internal Medicine), HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Organisational development < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Human resource management < HEALTH SERVICES ADMINISTRATION & MANAGEMENT |
| | |

*I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.*

*The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.*

*Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.*

# Evaluating the Effectiveness of Unconscious Racial Bias Training for NHS Senior Practitioners to Improve the Experiences of Black, Asian and Minority Ethnic Students

Charlotte R. Pennington[1*], Eleanore Bliss[2], Alisha Airey[2], Mandy Bancroft[2], Maxine Pryce-Miller[3]

[1] School of Psychology, Aston University, Birmingham, UK.

[2] Faculty of Health & Applied Sciences, University of the West of England, Bristol, UK.

[3] School of Nursing, Midwifery and Health, University of Coventry, UK.

*Correspondence concerning this article should be addressed to: Dr Charlotte R. Pennington, School of Psychology, Faculty of Health & Life Sciences, Aston University, Birmingham, B4 7ET. E-mail: c.pennington@aston.ac.uk ORCID ID: https://orcid.org/0000-0002-5259-642X

**Funding:** The work was supported by a Health Education England (HEE) grant (reference: EHAS0025). The funder had no role in the design and conduct of the study, the analyses, or their interpretation, nor the decision to prepare and submit the manuscript for publication.

**Conflict of Interest:** None.

**Transparency & Openness:** The study was preregistered (https://osf.io/5w8fc) and all materials, anonymised quantitative data, and analysis syntax are publicly available, as well as a statement outlining any necessary deviations to the preregistration protocol (https://osf.io/yfa6s/).

## Abstract

**Objective:** The degree awarding gap indicates that Black, Asian, Minority Ethnic (BAME) higher education students receive lower degree classifications relative to their White peers. Whilst the reasons for this are complex, research suggests that educator and practitioner attitudes and behaviour towards BAME students are a contributing factor. This preregistered study evaluates the effectiveness of unconscious racial bias training (URBT) to enhance NHS Senior Practitioners recognition of how racial inequalities negatively affect BAME students in higher education and healthcare practice. **Methods:** Forty-nine Senior participants completed a 4-hour URBT workshop with activities focusing on activating stereotypes, exploring differences between unconscious and implicit bias, discussing the development of bias, and reflecting on student experiences of prejudice, harassment, and discrimination. They completed pre- and post-measures that assessed the effectiveness of the training, racial competency, and awareness and perceptions of unconscious racial bias. One month later, participants reported how URBT had influenced their practice. **Results:** Participants reported positive evaluations of URBT, higher racial competency, and awareness and perceptions of racial bias after the training ($p < .001$, $dz > .35$). After one-month, key themes from qualitative responses suggest that participants had increased self-awareness and were exploring how to set up mentoring and working groups, change recruitment and progression processes, and diversify the taught curriculum. **Conclusions:** URBT may be one effective strategy to enhance awareness and encourage reflection of racial bias. We discuss how reducing racial inequalities requires a multi-faceted approach that affords upfront conversations about systematic racism and continuous evaluation.


**Key words:** degree awarding gap; racial inequality; unconscious bias; higher education; healthcare practice; unconscious bias training.

**Strengths and Weaknesses**

- (+) In line with recommendations, we delivered unconscious racial bias training to NHS Senior Practitioners in the practice and higher education environment with the training focused explicitly on increasing awareness of and concern about racial bias. NHS Senior Practitioners are in leadership and management positions that allow them to implement significant changes to the healthcare and education environment, so this targeted population represents a strength of our research.
- (+) We gathered both quantitative and qualitative outcome measures of the training, and also explored how the training had been implemented in practice one-month later.
- (-) Our study assesses self-report evaluations of behaviour change, but does not assess longer-term objective measures (e.g., changes in BAME student attainment, staff retention, progression, and disciplinary hearings).
- (-) Research suggests that the effectiveness of training may decay over time, so a longer or additional follow-up period would be fruitful (however, this can introduce an equitable challenge of greater response attrition).

## Introduction

*"The NHS was established on the principles of social justice and equity. In many ways, it is the nation's social conscience, but the treatment of our colleagues from minority groups falls short far too often". (NHS People Plan, 2020/21, pp. 23).*

Racial inequality persists within education, healthcare, and workplace settings. As students within higher education, Black, Asian, Minority Ethnic (BAME) individuals are awarded significantly lower degree classifications than their White peers (NUS & Universities UK, 2019; HESA, 2019; Office for Students, 2019). As healthcare patients, the treatments they receive are inadequate and mortality rates are higher due to racial inequalities in healthcare (Hoffman et al., 2016; Public Health England, 2020; MBRRACE-UK, 2018; Yaya et al., 2020). As healthcare practitioners, they experience racial discrimination and harassment, report more risks to their personal safety, are less represented at senior levels, and face more obstacles in their career progression (Appleby, 2018; Atewologun et al., 2019; Milner et al., 2020; Royal College of Nursing, 2020). As reported in the British Medical Journal's special issue on "*racism in medicine*", these statistics have remained stable over the past twenty years and require urgent action (Adebowale et al., 2020; Iacobucci, 2020). The National Healthcare Service (NHS) have responded to these concerns, outlining their commitment to addressing health inequalities for staff, students, and patients through the Workforce Race Equality Standard (2020/2021), the NHS People Plan (2020), and Race and Health Observatory (Kmietowicz, 2020a; Naqvi et al., 2021). Despite these reports showing some signs of progress, the NHS recognise that continuous improvement is required for them to become a fully inclusive, equitable and fair organisation.

The United Kingdom Government has also recently announced that it demands improvements to BAME students experiences and attainment in higher education, putting the spotlight on the sector to explore the factors involved in the 'degree awarding gap' and make

a genuine pledge to reduce racial disparities (Cabinet Office, 2017; Equality and Human Rights Commission, 2019). The degree awarding gap shows the percentage point difference between the proportion of UK domiciled BAME students awarded a first or 2:1 degree classification upon graduation (Universities UK 2019). Despite holding equivalent entry qualifications, BAME students are approximately 13% less likely to be awarded a 1st or 2:1 grade compared to their White peers, and this increases to 23% when looking at Black students exclusively (NUS & Universities UK, 2019; HESA, 2019). This racial awarding gap is significantly higher than that of all other student groups, with some universities reporting differences of up to 30% (Office for Students, 2019). These disparities result in a 'leaky pipeline' with Black students 1.5 times more likely to discontinue their studies compared to any other ethnic group (Office for Students, 2019). Importantly, these disparities are suggested to be caused by the HE environment itself, with BAME students reporting problems with the academic environment, curriculum, assessment practice and academic support (Smith, 2017; Stevenson, 2012). They also report experiences of microaggressions – defined as subtle or offensive comments or actions directed at a minority group (Mind, 2020) – that adversely impact their sense of belonging, confidence, and progression at university (Ackerman-Barger et al., 2020; HEPI, 2016; Pryce-Miller et al., *in press*).

Students studying for a healthcare degree (e.g., Nursing, Midwifery) in the UK often undertake clinical practice placements alongside their studies. However, these practice placements have been found to be racially hostile environments that present a daunting prospect for aspiring BAME healthcare students (Schammell & Olumide, 2012; Godbold & Braithwaite, 2021). The Equality and Human Rights Commission (2019) state that 56% of students have been racially harassed both within the university campus and on placement. Despite this, many universities are slow and sometimes unresponsive to act: a freedom of information request indicated that, out of 40 medical schools in the UK, only half collected

data on students' complaints regarding racism and racial harassment (Kmietowicz, 2020b). Shockingly, this report also indicates that out of 60,000 students across the whole of the UK who made a complaint of racial harassment to their university in 2015/16, only 560 were officially recorded (Equality & Human Rights Commission, 2019). Similar trends are also evident in the workplace. Data from the NHS Workforce Race Equality Standard report (WRES Implementation Team, 2021) shows that 15.3% of BAME staff experience discrimination from their manager or colleagues compared to only 6.4% of White staff, with this disparity present within 82.7% of NHS trusts. Furthermore, only 40.7% of BAME staff believe that their organisation provides equal opportunities for career progression or promotion compared to 88.3% of White staff, which is reflected in their representation with only 9.2% of BAME staff in senior management roles. Combined, racial inequalities within higher education and healthcare practice are negatively and disproportionally affecting the achievement, retention, and progression of BAME students and staff, and reflect the broader issue of systemic racism within UK society (Godbold & Brathwaite, 2021).

Although the reasons for the degree awarding gap are complex and multi-factorial, research suggests that educator and practitioner attitudes and behaviour towards BAME students are a significant contributing factor (Bhopal & Pitkin, 2020; Morgan, 2016). Bhopal and Pitkin (2020) explain how the enactment of the Race Equality Charter – a measure recently introduced to address racial inequalities in higher education – actually works to enhance the reputation of the sector rather than tacking structural disadvantages faced by BAME students. This can also be seen in the way the degree awarding gap is discussed, and the interventions put forward to mitigate it. Specifically, the apparent differences in in academic achievement between BAME and White students are often portrayed through a deficit model. This model focuses on the personal attributes and characteristics of BAME students (e.g., their perceived lack of skills, knowledge, or experience) as explanations for

differences in attainment, therefore ascribing blame to the students themselves rather than an environment which perpetuates structural and institutional racism (Bhopal & Pitkin, 2020; NUS & Universities UK, 2019). This is acknowledged by the NHS who state that efforts to improve BAME staff representation at more senior levels have been overshadowed by an "over-focus on the deficit model; the notion that there are inherent weaknesses or deficits amongst BAME staff themselves, rather than deep-rooted issues within organisations" (NHS, 2019, pp. 11).

The persistent evidence of racial inequalities for BAME students and staff, coupled with global events such as the murder of George Floyd, have prompted universities and the NHS to address their roles in perpetuating racism and inequality. Task forces have been set up across the UK and US to confront racism and to decolonise the taught curriculum, and statements have been disseminated by universities to signal a commitment to anti-racist actions (Bhatia, 2017; Gillborn et al., 2021; Peters, 2018). On the surface, although these initiatives make it seem like progress is being made, many of them are inadequate, are implemented without input from BAME staff and students, do not lead to sustained change, and can lead to high-status group members reacting defensively (Bhopal & Pitkin, 2020; Dover et al., 2020; Kaiser et al., 2021; Ledgerwood et al., 2022; Watt, 2011). One active step has been to recommend that educators and healthcare practitioners undergo unconscious bias training (also referred to as 'diversity training'; Equality & Human Rights Commission, 2019; Smith, 2017), which aims to teach people about the snapshot judgements we make about others and how this can impact our attitudes and behaviours considerably (Equality Challenge Unit, 2013). The goal of this training is to encourage people to acknowledge their biases and consider their source, whilst also exploring proactive steps that they can take to promote an inclusive environment and challenge racism. It is suggested that once people are made aware

of their unconscious biases, they become explicit, and they have a responsibility to mitigate their impact on behaviour and decision-making (Equality Challenge Unit, 2013).

A large-scale evaluation by the Equality and Human Right's Commission (Atewologun et al., 2018) found that across 18 studies, unconscious bias training (UBT) was effective for awareness raising for advanced training designs and could reduce unconscious bias (e.g., Carnes, 2012; Forscher et al., 2017). However, they also highlighted that there is typically no long-term impact on behaviour and emotional prejudice following UBT, as well as the potential for the training to backfire when it is implied that stereotypes and biases are unchangeable. At first glance this report seems to conclude that there is insufficient evidence to indicate that UBT is effective for behaviour change, however the authors propose two main reasons for the mixed findings to date: 1) research examining behaviour change is limited, and 2), methods for evaluating behaviour change mostly have low validity, in that they do not measure actual observed change. Another review by the Behavioural Insights Team (2020), which came to similar conclusions, also states that the current evidence base is hindered by examining the effectiveness of UBT in university student populations and U.S. based settings, suggesting that there is a need for robust, repeated behavioural studies of UBT interventions in UK workplaces. Others have suggested that diversity initiatives, such as UBT, should be improved to focus on explicitly increasing awareness of and concern about racial bias, plant seeds that inspires continued learning, and teach strategies that allow participants to change their behaviour (Carter et al., 2020).

Underpinned by these recommendations, we developed and evaluated an unconscious racial bias training (URBT) workshop delivered to NHS Senior Practitioners in the practice and healthcare environment with the training focused explicitly on increasing awareness of and concern about racial bias. The implementation of this training represents a coordinated effort between the NHS and higher education to enhance awareness of how racial inequalities

negatively affect BAME students in UK higher education and healthcare practice.as one strategy to reduce the degree awarding gap. The overarching research question is whether URBT is effective in increasing knowledge, perceptions and awareness of racial bias and can lead to a process of reflection and change. To mitigate any potential biases, we preregistered the following confirmatory hypotheses and our analyses, and the training was delivered by two individuals who were independent from the analyses that follow.

H1: *Evaluation of training*. There will be an increase in positive evaluations of unconscious bias training from pre- to post-training suggesting that the training increased understanding of unconscious racial bias and willingness to engage and promote the training.

H2: *Racial competency*. There will be an increase in racial competency (i.e., racial beliefs and self-efficacy) from pre- to post-training suggesting that the training encouraged practitioners to reflect on their beliefs around race and how these impact mentoring, supervision, and interactions with BAME students/staff.

H3: *Awareness of unconscious bias*. There will be an increase in awareness of unconscious racial bias from pre- to post-training suggesting that the training enhanced recognition, awareness, and the impact of unconscious racial bias on BAME students/staff.

H4: *General perceptions of bias*. There will be an increase in perceptions of personal, societal, and professional bias from pre- to post-training suggesting that the training made people reflect more globally about these forms of bias and how they affect decision-making.

As well as examining immediate pre-post changes, we also assessed qualitative responses regarding the usefulness of the training and explored the degree to which participants had applied this in practice one-month later.

# Method

## Transparency & Openness

We report how we determined our sample size, all data exclusions and all measures that were included in the study. The study design and analysis plan were preregistered via the AsPredicted.org template on the Open Science Framework (https://osf.io/5w8fc). All materials, anonymised data, and analysis syntax are publicly available, as well as a statement outlining any necessary deviations to the preregistration protocol (https://osf.io/yfa6s/).

## Patient and Public Involvement

Patients or the public were not involved in the design, conduct, reporting, or dissemination plans of this research.

## Participants

Ethical approval was granted by the lead research institute (REF: HAS.20.02.136) and all participant's data was anonymised using a memorable identifier. Senior Nursing and Midwifery Practitioners from two NHS Trusts and a higher education institute were recruited via opportunity sampling to attend URBT. Our sample size justification was therefore based exclusively on resource constraints: specifically, the number of individuals who agreed to participate in the training (see Lakens, 2021). Sixty-one participants provided pre-training responses for our primary outcomes, but six of these were excluded due to duplicate identifiers and five for not providing matching post-training responses. This resulted in a final sample size of 49 participants ($M_{AGE}$ = 45.31, $SD$ = 10.20) of whom 41 identified as female and White British. Thirty-three were Nurses, nine Midwives, three Higher Education Lecturers, and four from other independent (and therefore anonymised) healthcare roles. The majority of the sample reported that they had been in their profession for 15 years or more (61.2%), followed

by 11-15 years (12.2%). Of this sample, 98% reported having completed 'Equality & Diversity' training at some point previously within their career.

Sensitivity power analyses were conducted in G*Power (Faul et al., 2007) to assess the minimum effect size we could reasonably detect with our final sample size across a range of desired statistical power levels. This indicated that for repeated measure analyses of pre- to post-training responses, we had 80% power to detect a moderate effect size of Cohen's $d_z = .41$ and 90% statistical power to detect $d_z = .47$.

**Procedure**

An email was sent to the Senior Management Team within two NHS Trusts and a higher education institute requesting that staff sign-up to an URBT workshop. Participants signed up to one of 16 workshops, which were delivered online via Microsoft Teams due to the restrictions imposed by the COVID-19 pandemic. The workshops were developed and delivered by two individuals who identify as a Black British and White British female and limited to groups of 10 participants to encourage engagement and active discussion. Each training workshop was approximately four hours long and included seven main activities that focused on activating stereotypes, exploring the difference between unconscious and implicit bias, defining key terms (affinity bias, halo effect, in/out-groups, stereotypes, confirmation bias and group attribution), discussing the development of bias, and reflecting on experiences of prejudice, harassment, and discrimination (materials: https://osf.io/yfa6s/). After each activity, the trainers engaged in reflections, group discussions, and question-and-answers. At the end of the training, participants were presented with key statistics regarding racial inequality from the NHS WRES (WRES Implementation Team, 2019) and completed a quiz to reinforce their learning.

Participants were informed that the learning objectives of the training were: (1) "To *know*: what unconscious bias is and how it impacts the people around us", (2), "To be *aware:*

of the barriers our own unconscious bias can create for the people around us, and (3) "To *do*: commit to a change in practice". They completed a battery of primary outcome measures pre- and post-training, which allowed us to evaluate its effectiveness[1]. They also completed one exploratory measure that allowed us to assess how they had applied the training in practice after one-month.

**Primary Outcome Measures**

The following measures were administered both pre- and post-training to evaluate the effectiveness of unconscious bias training.

***General Training Evaluation***

We adapted a general evaluation questionnaire from the National Women's Council of Ireland Report (2015) on "Recognising and challenging our unconscious biases". This questionnaire included 10 statements such as "I feel comfortable participating in this training". Responses were recorded on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) and resulted in acceptable internal reliability both pre- (Cronbach's $a$ = .78) and post-training ($a$ = .87). A total score was calculated for each timepoint (range 10-50), with higher scores representing more positive evaluations of the training. After the questionnaire, participants completed open-ended questions that asked: "What did you find the most useful and why?" and "How will you apply this training in practice?".

***Racial Competency***

Racial competency was measured using an adapted version of the cultural beliefs and self-efficacy sub-scale from the Cultural Competency Questionnaire (Hausmann et al., 2014). Specifically, the term 'culture' was replaced to ask specifically about race. This questionnaire

[1] We focused our evaluation on explicit self-report measures given current controversy over implicit attitude measures and their predictive validity (e.g., the Implicit Association Test [IAT]; see Corneille & Hutter, 2020; Schimmack, 2021).

includes six statements such as "students/staff may identify with more than one racial group" recorded on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The questionnaire resulted in low internal reliability for pre-training responses due to the item "I am aware of the limits of my competency when interacting with students/staff who are a different race to me". Removal of this item improved reliability for pre-responses ($a$ = .61) and was therefore removed also for post-responses to allow for comparison ($a$ = .64). A total score was calculated for each timepoint (range 5-25), with higher scores representing greater perceptions of racial competency.

***Awareness of Unconscious Bias***

Participants were asked "Have you ever heard of the term 'unconscious bias'?" both pre- and post-training and, if they responded "Yes", were asked to define the term. Awareness and attitudes regarding unconscious bias were then measured using the Attitudes Towards Unconscious Bias Scale (Hausmann et al., 2014). This questionnaire included six statements such as "Mentors can have biases about students/staff of which they are unaware" recorded on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The questionnaire resulted in acceptable internal reliability both pre- ($a$ = .80) and post-training ($a$ = .82). A total score (range 6-30) was calculated for each timepoint, with higher scores representing greater awareness of unconscious bias.

***Perceptions of Bias***

Perceptions of bias were measured using an adapted version of the General Perceptions of Bias scale (Girod et al., 2014). This questionnaire included eight statements with three sub-scales of personal bias ("In most situations, I am objective in my decision making), societal bias ("People in today's society tend to treat people of different social groups equally"), and healthcare bias ("In healthcare practice, racial bias is no longer a problem in hiring decisions"). Allowing for consistency with our other scales, responses were measured on a 6-point Likert

scale (1 = Strongly Disagree, 6 = Strongly Agree) and then reversed in line with Girod et al. (2016). The questionnaire resulted in acceptable internal reliability both pre- ($a$ = .86) and post-training ($a$ = .75). A total score (range 8-48) was calculated for each timepoint with higher scores representing greater perceptions of bias (i.e., more 'disagree' responses).

**Exploratory Outcome Measures**

The following exploratory measure was administered post-training only.

***Applications of Training in Practice***

Approximately one-month after the training, participants were sent a follow-up questionnaire that asked them to reflect on how they had applied the training in their practice. This was registered as an exploratory outcome measure because we expected a relatively high attrition rate with the survey being distributed via email. First participants were asked: "Do you believe you have been successful in applying the training within your practice?", responding with either a "Yes" or "No" answer. In line with Hausmann et al. (2014), they then responded to seven statements such as "since the unconscious bias training workshop I have reflected on how my biases may affect student/staff mentoring" on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). This questionnaire resulted in excellent internal reliability ($a$ = .92). Descriptive statistics (% of agreement/disagreement with each statement) are reported to assess how participants have applied the training in practice. Participants then responded to three open-ended questions that asked: "Since learning about unconscious bias, in what way do you think that this might influence your practice?", "How have you applied the training in your practice?" and "Have you had any difficulties/challenges in applying this training in your practice?".

**Analytical Strategy**

Analyses were conducted in SPSS (v.26; IBM Corp, 2019). Missing questionnaire data was inputted using the mean for that particular questionnaire item ('mean imputation', <5% of

cases: Tabachnick & Fiddell, 2012). Confirmatory analyses focused on changes in evaluations, racial competency, awareness, and perceptions of unconscious racial bias from pre- to post-training. These were each measured using a repeated measure Analysis of Variance (ANOVA) with an alpha level of .05 used to determine statistical significance. In line with previous research (Hausmann et al., 2019; Stevenson et al., 2019) we report the percentage of agreement/disagreement with each statement for the General Training Evaluation and the Applications of Training in Practice measures. Reflexive thematic analysis (Braun & Clarke, 2008; 2021) was employed to code responses to the open-ended questions and develop key themes. In this process, coding is recognised as a subjective process that requires a reflexive researcher who strives to reflect on their assumptions and how these might shape and delimit their coding. It includes the phases of familiarisation, coding, generating initial themes, reviewing, and developing themes, refining, defining, and naming.

## Results

### Primary Outcomes

***Evaluation.*** There was a significant increase in positive evaluations of unconscious bias training from pre- ($M$ = 38.71, $SD$ = 4.37) to post-training ($M$ = 47.08, $SD$ = 3.09), $F$ (1, 48) = 210.20, $p < .001$, $\eta p2$ = .81, $d_z$ = 2.08. As can be seen in Table 1, the training was evaluated positively, with the majority of participants responding "Agree" or "Strongly Agree" to each item. In support of Hypothesis 1, this suggests that the training increased understanding of unconscious racial bias and willingness to engage and promote the training.

Table 1. *Percentage of agreement/disagreement with each item of the training evaluation (post-training responses only).*

| | SD | D | N | A | SA |
|---|---|---|---|---|---|
| 1. I felt comfortable participating in this training. | - | - | 2.0% | 32.7% | 65.3% |
| 2. This training is relevant to me in my own work. | - | - | - | 16.3% | 83.7% |
| 3. I have an understanding of unconscious racial bias. | - | - | - | 26.5% | 73.5% |

| | | | | | |
|---|---|---|---|---|---|
| 4. I have an understanding of the negative impact of unconscious racial bias. | - | - | - | 30.6% | 69.4% |
| 5. I have an understanding of the benefits of addressing unconscious racial bias. | - | - | - | 22.4% | 77.6% |
| 6. I have an understanding of techniques to reduce my own unconscious racial bias. | - | - | 10.2% | 57.1% | 32.7% |
| 7. I have a clear idea of how I will apply the learning from this training in my own role. | - | - | 8.2% | 40.8% | 51.0% |
| 8. I would recommend this training to other colleagues. | - | - | - | 8.2% | 91.8% |
| 9. I would recommend this training to senior management. | - | - | - | 6.1% | 93.9% |
| 10. This training is useful. | | | | 10.2% | 89.8% |

Four main themes were identified from the open-ended question "what did you find the most useful and why": (1) reflections of unconscious racial bias; (2) lived experiences of discrimination, (3) a non-judgemental, open space, and (4) prompting reflections of making a positive change. Three main themes were identified from the question "how will you apply this training in practice?": (1) confronting racial bias; (2) enabling conversations about race; and (3) enacting real change. Example excerpts are provided in Table 2.

Table 2. *Key themes from open-ended responses to the evaluation questionnaire.*

| ***"What did you find the most useful and why?"*** | | | |
|---|---|---|---|
| **Theme 1: Reflections of unconscious bias** | **Theme 2: Lived experiences of discrimination** | **Theme 3: A non-judgemental, open space** | **Theme 4: Making a positive change** |
| "Facilitated reflection of own lack of knowledge of the subject and individuals' experiences, which was distressing at times." | "Real examples of the struggle/ discrimination BAME staff have/experience in the workplace." | "Safe discussions around common misconceptions and issues - built confidence in exploring these themes." | "Very uncomfortable learning but absolutely essential to make any changes moving forwards. The more open we are, the more we can learn and take positive steps." |
| "considering our personal unconscious bias and the impact on our professional lives." | "the student narrative was particularly powerful." | "I felt comfortable and able to express myself and explore the issues and challenges." | "It was also helpful in terms of application to academic practice - for example, thinking about how to have conversations about race with staff in practice." |
| "it was thought provoking in terms of understanding unconscious bias and reviewing how our own values and beliefs might impact on our practice." | "the student stories. this had the most impact on my understanding of how real and prevalent this pro[b]lem still is." | "Being able to talk freely about experiences, knowing that it was a safe space without judgement and ask questions." | "I'm very keen on looking at the deficit model as how I can implement change and overcome barriers within recruitment and development |

| | | |
|---|---|---|
| | | opportunities." |
| ***"How will you apply this training in practice?"*** | | |
| **Theme 1: Confronting racial bias** | **Theme 2: Enabling conversations about race** | **Theme 3: Enacting real change.** |
| "*Addressing* my language that I use with students if they come to me with an issue related to racial discrimination". | "*Encouraging* student conversations about this, dedicating time and space to exploring practice related challenges with the students." | "*Reviewing* and amending teaching materials to ensure that there is representation and including voices that is missing from the information presented." |
| "I will speak more openly about discrimination, listen to each individual's experience. Raise/escalate concerns. Have difficult conversations and continue to listen and be aware of my own unconscious bias." | "Encourage conversations on the ward regarding race and experience of our BME members of staff - to formalise this process on the back of […] risk assessments and ask staff how it is to work on my unit as a member of staff from their background/heritage to explore potential issues and understand their perspective". | "Work with the Equality, Diversity and Inclusion lead, alongside the Nursing and Midwifery team to review applications, career opportunities and working to always include the those whose associate themselves as BAME origin with policy changes and ideas." |
| "I will be more aware of my own unconscious bias, taking techniques forward to one-to-one and new staff inductions/training. I will ensure I feel more comfortable talking about race and religion to people of all backgrounds." | "engage with BAME staff to understand more their lived experiences of unconscious bias and prejudice. Engage with students to help empower them more to seek help if they are experience racial prejudice." | "I will use it in recruitment, education, engagement with students, engaging with the BME forum and promoting this to staff, engaging with the LEF team when students raise concerns." |

***Racial Competency.*** There was a significant increase in perceptions of racial competency from pre- ($M$ = 19.85, $SD$ = 2.14) to post-training ($M$ = 21.81, $SD$ = 2.17), $F$ (1, 47) = 37.63, $p < .001$, $\eta p2$ = .45, $d_z$ = .88. In support of Hypothesis 2, this suggests that the training encouraged participants to reflect on their beliefs around race and how these impact mentoring, supervision, and interactions with BAME students and staff.

***Awareness of unconscious bias.*** There was a significant increase in awareness of unconscious bias from pre- to post-training: more participants reported that they recognised this term ($M_{PRE}$ = 89.13[%], $SD$ = 31.47, $M_{POST}$ = 100.00[%], $SD$ = .00), $F$(1, 45) = 5.49, $p$ = .02, $np2$ = .11, $d_z$ = .35, and reported that they were more aware of its impact on staff and students ($M_{PRE}$ = 25.00, $SD$ = 2.63, $M_{POST}$ = 27.65, $SD$ = 2.59), $F$(1, 47) = 40.60, $p < .001$, $\eta p2$ = .46, $d_z$ = .92. In support of Hypothesis 3, this suggests that the training increased overall awareness of unconscious bias.

***Perceptions of bias.*** There was a significant increase in perceptions of bias from pre- ($M$ = 30.92, $SD$ = 7.69) to post-training ($M$ = 35.74, $SD$ = 5.23), $F$ (1, 47) = 29.27, $p < .001$, $\eta p2$ = .38, $d_z$ = .78. In support of Hypothesis 4, this suggests that the training increased perceptions of personal, societal, and professional bias and how they affect decision-making. Figure 1 displays the pre- and post- primary outcome measures.

[**Figure 1.** A raincloud plot displaying pre- to post-training changes in training evaluations, racial competency, awareness, and perceptions of unconscious racial bias. Left = individual data points from pre- to post-training, middle = interquartile range and confidence intervals, right = data distribution. **]**

## Exploratory Outcomes

After exclusion of duplicate or missing participant identifiers ($n$ = 9), a total of 17 participants responded to the one-month follow-up questionnaire. Of this sample, 76.5% responded "yes" to the question "do you believe you have been successful in applying the training within your practice?". As can be seen in Table 3, the majority of participants responded 'Agree' or 'Strongly Agree' to six out of the seven questions; however, for the question "I have noticed a positive change in the way that students/staff respond to my mentoring", the majority responded with "Neither agree nor disagree".

Table 3. *Percentage of agreement/disagreement with each item of the one-month follow-up questionnaire.*

| | SD | D | N | A | SA |
|---|---|---|---|---|---|
| 1. [I have…] applied the knowledge learnt to my own practice. | - | - | 11.8% | 58.8% | 29.4% |
| 2. Been aware of how my biases may impact student/staff mentoring. | - | - | - | 47.1% | 52.9% |
| 3. Reflected on how my biases may affect student/staff mentoring. | - | - | 5.9% | 52.9% | 41.2% |
| 4. Created new habits to explore my unconscious biases. | - | 5.9% | 11.8% | 52.9% | 29.4% |
| 5. Noticed a positive change in the way that students/staff respond to my mentoring. | - | - | 64.7% | 11.8% | 23.5% |
| 6. Been able to share what I learned with other colleagues. | - | - | 5.9% | 35.3% | 58.8% |
| 7. Been able to discuss race more confidently. | - | - | 11.8% | 52.9% | 35.3% |

Four themes were identified from the open-ended questions "since learning about unconscious bias, in what way do you think that this may influence your practice?" and "how have you applied the training in your practice?. The themes identified were (1) setting up mentoring and working groups, (2) changing the recruitment and progression process, (3), increased self-awareness, and (4) diversifying the taught curriculum. Example excerpts are provided in Table 4.

Table 4. *Key themes from open-ended responses to the 'Applications of training in practice' questionnaire.*

| ***"Since learning about unconscious bias, in what way do you think that this might influence your practice?" and "How have you applied the training in your practice?"*** | | | |
|---|---|---|---|
| **Theme 1: Setting up mentoring & working groups** | **Theme 2: Changing the recruitment & progression process** | **Theme 3: Increased self-awareness** | **Theme 4: Diversifying the taught curriculum** |
| "Trying to implement change through listening to other people's views. such as creating working groups to answer questions about making services more accessible". | "It has made me think about our recruitment process and how we advertise posts. Also i have done some interviews and it has made me more awa[r]e of the ques[t]ions I am asking and how others interpret these. I defin[i]tely have a better understanding of my unconscious bias and how that has influen[c]ed decisions in the past. I have shared what I learnt with my team, and this has been really powerful". | "It has changed the way I think and perceive people. Being an [RACE REDACTED], I have faced a lot of bias myself and I clearly understand how it feels. I might have had biases against people which I was not aware of. This training has helped me be more conscious about my thoughts. Even when I talk to students, I am conscious of my body language and words that I use so that I don't make them uncomfortable. I think it was the best decision to attend the training". | " I am explicitly including sessions about race and bias in modules eg in a palliative care module this autumn I have added "Approaches to death and dying in different cultures" and will be asking the students to consider how this is viewed in the wards they have worked on". |
| "I am looking for my teams to provide mentoring and coaching to our BAME staff to support their leadership development and application". | IN my recruitment campaigns. In my attitudes towards the recruitment process and my thoughts on mentoring students. | "It has made me more aware of how what is said may have a cumulative effect on staff members, even if comments or questions are intended in a friendly or curious way e.g. micro aggressions" | "my inclusion of bias (conscious and unconscious) will be more explicit in my lesson planning (rather than implied). I am part of a working group that will be considering assessment and am very conscious of the need to actively explore the reasons for the attainment gap". |
| "i want to set up a focus group to look at how we can provide suitable infant feeding support for black mothers. i want to engage with b[la]ck staff to explore their experiences w[o]rking in our dept". | "i want to challenge recruitment specifically in recruitment of MSWs [Medical Social Workers]". | "This will influence the content of my teaching sessions and interactions with students. It has influenced the language that I use and the slight increase in confidence I have gained in opening conversations about race". | Ensuring that each contact made with students discusses all the topics raised in the training in a "discussion base. I have also added to my materials on slides etc" |

## Discussion

The degree awarding gap indicates that Black, Asian, Minority Ethnic (BAME) students receive lower degree classifications relative to their White peers, and this is coupled with experiences of racial prejudice and discrimination in higher education and their placement/practice environment. Research suggests that educator and practitioner attitudes and behaviour towards BAME students are a contributing factor (Bhopal & Pitkin, 2020; Morgan, 2016) and should therefore be attended to in racial equality initiatives. The current study evaluated the effectiveness of unconscious racial bias training (URBT) delivered to NHS Senior Practitioners to enhance awareness of how racial inequalities negatively affect BAME students. In line with hypotheses, findings indicate that participants reported overall positive evaluations of URBT and higher racial competency, awareness of unconscious racial bias and perceptions of bias after the training. Qualitative responses suggest that participants had increased self-awareness and were exploring how to set up mentoring and working groups, change recruitment and progression processes, and diversify the taught curriculum. This suggests that URBT may be one effective strategy to increase knowledge, perceptions, and awareness of racial bias in UK higher education and healthcare practice, and lead to a process of reflection and change.

Previous research has found mixed findings with regards to the effectiveness of unconscious bias training (Atewologun et al., 2018; Behavioural Insights Team, 2020), and have made several recommendations to improve it (Behavioural Insights Team, 2020; Carter et al., 2020). Informed by these, we developed and evaluated an URBT workshop to ensure that it was explicitly aimed at increasing understanding and awareness of unconscious racial bias and how this directly impacts BAME students and staff, as well as exploring strategies to mitigate this. To facilitate sustained reflection and change, we also surveyed participants one-month after the training to ask how they had implemented the training in practice. The observed

success of this training therefore highlights the importance of tailored interventions that are designed with a specific audience in mind, provide explicit learning outcomes that emphasise the need for continuous reflection, and embed the problem within its applied context.

Participant's qualitative responses highlight further useful aspects of the training, which can inform future research into the implementation of URBT. Two of the themes suggested that the training was useful because it *facilitated reflections of unconscious bias and* highlighted *lived experiences of discrimination.* The focus on the student narrative allowed participants to "consider their unconscious bias" and "review how [their] values and beliefs might impact on practice". A third theme suggested that the *non-judgemental, open space* was useful because it fostered "safe discussions around common misconceptions" and allowed people to "explore issues and challenges" and "talk freely about experiences". This may have helped to overcome defensive reactions towards bias, which has been previously reported as an unintended consequence of diversity initiatives (Kaiser et al., 2021; Watt, 2011). Finally, participants suggested that the training prompted *reflections of making a positive change,* such as "thinking about how to have conversations about race with staff in practice" and "looking at the deficit model to implement change and overcome barriers with recruitment and development opportunities". This highlights the importance for URBT to be action-oriented so that raised awareness of racial bias is coupled with strategies for mitigating it (Carter et al., 2020).

Participants also responded positively when asked about how they would apply this training in practice, with three themes centering on *confronting racial bias, enabling conversations about race,* and *enacting real change.* However, it's important to note that these responses were gathered immediately after the training, so it is imperative to focus on responses after one-month of completing the training. Here, the majority of participants agreed that they have applied the knowledge learnt to their own practice, reflected on how their biases may

affect student/staff mentoring, created new habits to explore unconscious biases, and been able to discuss race more confidently. They also strongly agreed that they have been aware of how their biases may impact student/staff mentoring and been able to share what they had learned with other colleagues. Nevertheless, participants were also neutral with regards to noticing a positive change in the way that students/staff have responded to their mentoring. This may reflect the short-follow up period in which participants were asked this question, highlighting the need for continuous evaluation to ensure that URBT has its intended impact of reducing racial inequalities in the longer-term.

At this stage, four themes were also identified which were *setting up mentoring and working groups*, *changing the recruitment and progression process*, *increased self-awareness*, and *diversifying the taught curriculum*. The first theme showed how participants were exploring how to "provide mentoring to our BAME staff to develop their leadership development", "listening to other people's views" to implement change, and "setting up a focus group to […] support Black mothers" and "engage with Black staff". Within the second theme, participants expressed how the training had made them "think about recruitment processes" and "challenging" these to be more equitable. A general theme throughout these quotes was increased self-awareness of perceptions towards BAME students and staff, for example being "more aware of how what is said may have a cumulative effect on staff members" and how implicit behaviour such as "body language" and "microaggressions" impacts this. The final theme highlighted how the training had encouraged participants to diversify the taught curriculum, with excerpts focusing on "including sessions about race and bias in modules" and ensuring that the "inclusion of bias [is] more explicit in lesson planning", and the need to "actively explore the reasons for the attainment gap". These themes are encouraging given that the training was targeted at staff in senior management roles who hold the power to make substantial changes in the NHS and higher education environment. However, given that

training effects can decay over time (Bezrukova et al., 2016), longitudinal research is required to assess the effectiveness of this training with more objective indicators of behaviour change (e.g., changes in BAME student attainment, staff retention, progression, and disciplinary hearings).

Although the majority of qualitative responses were positive, it's important to note that a few of participant's quotes revealed inherent racial biases within them, too. For example, when asked "since learning about unconscious bias, in what way do you think that might influence your practice?", one participant responded that one barrier was "when people of colour play the race card when they are being managed about their performance. People are not confident in how to challenge appropriately". This language reveals unconscious racial biases ("race card") that may perpetuate racial inequalities by passing the blame onto BAME students and staff themselves. When asked the same question, another participant responded that "I also think there is a risk that it may have a negative effect on my under[st]anding of different cultures as I am less likely to ask staff questions about differences in cultures in case this is perceived to be micro aggressions". Although there were only a few instances of such responses, we include them here to highlight finer nuances around the effectiveness of this training and the need for continued education to eradicate bias. Future URBT could follow-up with participants after their training to explore their responses further and dismantle any misunderstandings.

We emphasise like others (Atewologun et al., 2018), that URBT should be treated as one element of a comprehensive and continually evaluated strategy to achieve racial equality. Effectively tackling the degree awarding gap requires a shift away from relying upon the deficit model to explain differences between BAME students and their White peers and a closer look towards an environment that perpetuates structural and institutional racism (Bhopal & Pitkin, 2020; NUS & Universities UK, 2019). Furthermore, open and honest conversations about racial

inequality are essential outside of URBT to ensure indefinite, positive change (Pryce-Miller et al., *in press*). The NHS have outlined their commitment to addressing racial inequalities through the WRES report (WRES Implementation Team, 2021), NHS People Plan (2020), and Race and Health Observatory (Kmietowicz, 2020a; Naqvi et al., 2021). However, we argue that it is important that the degree awarding gap is also addressed within these strategies to ensure that BAME students receive equitable education and healthcare placement experiences, and the NHS meets its goal of being a "fully inclusive, equitable and fair employer" (WRES Implementation Team, 2021).

**Conclusions**

The degree awarding gap between Black, Asian and Ethnic Minority (BAME) students and their White peers is well documented within UK universities and these students continue to experience prejudice and discrimination within the higher education and healthcare environment. The current study represents a coordinated effort between the NHS and higher education sector to evaluate the effectiveness of unconscious racial bias training (URBT) to improve the experiences of BAME students. Our findings indicate that URBT may be a useful component of wider racial equality initiatives to increase knowledge, perceptions and awareness of racial bias and lead to a process of reflection and change. One-month later, qualitative themes suggest that participants had increased self-awareness of how they perceive and treat BAME students and staff and were exploring how to set up mentoring and working groups, change recruitment and progression processes, and diversify the taught curriculum. Although this study highlights the potential effectiveness of URBT, we emphasise that it is not a panacea; instead, a multi-pronged approach is required that affords upfront conversations about systematic racism, implements effective initiatives to create racially inclusive and equitable environments, and enacts policies and procedures that dismantle long-standing racial inequalities in both education, healthcare, and society.

## References

Ackerman-Barger, K., Boatright, D., Gonzalez-Colaso, R., Orozco, R., & Latimore, D. (2020). Seeking inclusion excellence: Understanding racial microaggressions as experienced by underrepresented medical and nursing students. *Academic Medicine, 95*, 758-763. https://doi.org/10.1097/acm.0000000000003077

Adebowale, V., & Rao, M. (2020). Racism in medicine: why equality matters to everyone. *The BMJ, 368,* m530. https://doi.org/10.1136/bmj.m530

Appleby, J. (2018). Ethnic pay gap among NHS doctors. *The BMJ, 362*, k3586. https://doi.org/10.1136/bmj.k3586

Atewologun, D., Cornish, T., & Tresh, F. (2018). Unconscious bias training: An assessment of the evidence for effectiveness. *Equality & Human Rights Commission, Research report 113.* Available from: https://www.equalityhumanrights.com/sites/default/files/research-report-113-unconcious-bais-training-an-assessment-of-the-evidence-for-effectiveness-pdf.pdf

Atewologun, D., Kline, R., & Ochieng, M. (2019). Fair to refer? Reducing disproportionality in fitness to practise concerns reported to the GMC. *General Medical Council.* Available from: https://www.gmc-uk.org/-/media/documents/fair-to-refer-report_pdf-79011677.pdf

Behavioural Insights Team (2020). Unconscious bias and diversity training – what the evidence says. Available from: https://www.bi.team/wp-content/uploads/2020/12/20-12-14-Unconscious-Bias-Training-BIT-report-1.pdf

Bezrukova, K., Spell, C. S., Perry, J. L., & Jehn, K. A. (2016). A meta-analytical integration of over 40 years of research on diversity training evaluation. *Psychological Bulletin, 142*, 1227–1274. https://doi.org/10.1037/bul0000067

Bhatia, S. (2017). *Decolonizing psychology: Globalization, social justice, and Indian youth identities*. Oxford University Press.

Bhopal, K., & Pitkin, C. (2020). 'Same old story, just a different policy': Race and policy making in higher education in the UK. *Race, Ethnicity, & Education, 23,* 530-547. https://doi.org/10.1080/13613324.2020.1718082

Braun, V., & Clarke, C. (2021). Can I use TA? Should I use TA? Should I *not* use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling & Psychotherapy Research, 21,* 37-47. https://doi.org/10.1002/capr.12360

Braun, V., & Clarke, V. (2008). Using thematic analysis in psychology. *Qualitative Research in Psychology, 2,* 77-101. https://doi.org/10.1191/1478088706qp063oa

Cabinet Office. (2017). Race Disparity Audit: Summary findings from the ethnicity facts and figures website. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/686071/Revised_RDA_report_March_2018.pdf

Carnes, M., Devine, P. G., Isaac, C., Baier Manwell, L., Ford, C. E., Byars-Winston, A., Fine, E., & Thurik Sheridan, J. (2012). Promoting institutional change through bias literacy. *Journal of Diversity in Higher Education, 5,* 63-77. https://doi.org/10.1037/a0028128

Carter, E. R., Onyeador, I. N., & Lewis, N. A. (2020). Developing and delivering effective anti-bias training: Challenges & recommendations. *Behavioral Science & Policy, 6,* 57-70. https://doi.org/10.1353/bsp.2020.0005

Corneille, O., & Hutter, M. (2020). Implicit? What do you mean? A comprehensive review of the delusive implicitness construct in attitude research. *Personality & Social Psychology Review,* 1-21. https://doi.org/10.1177/1088868320911325

Dover, T. L., Kaiser, C. R., & Major, B. (2020). Mixed signals: The unintended effects of diversity initiatives. *Social Issues and Policy Review*,*14*, 152-181. https://doi.org/10.1111/sipr.12059

Equality and Human Rights Commission. (2019). Tackling racial harassment: Universities challenged. Available from: https://www.equalityhumanrights.com/en/publication-download/tackling-racial-harassment-universities-challenged

Faul, F., Erdfelder, E., Lang, A-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39,* 175-191. https://doi.org/10.3758/bf03193146

Forscher, P. S., Mitamura, C., Dix, E. L., Cox, T. L., Devine, P. G. (2017). Breaking the prejudice habit: Mechanisms, timecourse, and longevity. *Journal of Experimental Social Psychology, 72,* 133-146. https://doi.org/10.1016/j.jesp.2017.04.009

Gillborn, S., Woolnough, H., Jankowski, G., & Sandle, R. (2021). 'Intensely white': Psychology curricula and the (re)production of racism. *Ahead-of-print*, 1-20 *Educational Review*. https://doi.org/10.1080/00131911.2021.1978402

Girod, S., Fassiotto, M., Grewal, D., Candy-Ku, M., Sriram, N., Nosek, B. A., & Valantine, H. (2016). Reducing implicit gender leadership bias in academic medicine with an educational intervention. *Academic Medicine, 91*, 1143-1150.

Godbold, R., & Braithwaite, B. (2021). Minding the gap: Improving the Black Asian and minority ethnic student awarding gap in pre-registration adult nursing programmes by decolonizing the curriculum. *Nurse Education Today, 98,* 104667. https://doi.org/10.1016/j.nedt.2020.104667

Godbold, R., & Brathwaite, B. (2021). Minding the gap. Improving the Black Asian and minority ethnic student awarding gap in pre-registration adult nursing programmes by

decolonizing the curriculum. *Nurse Education Today, 98,* https://doi.org/10.1016/j.nedt.2020.104667

Hausmann, L. R. M., Burgess, D. J., Frankenfield, L., Long, J. A., Mor, M. K., Obrosky, D. S., Red, L. A., Rodriguez, C. J., & Saha, S. (2014). *Evaluation of a pilot program to improve patient health care experiences through PACT cultural competency training about unconscious bias.* Department of Veterans Affairs, Veterans Health Administration.

Higher Education Statistics Agency [HESA] (2019). What are HE students' progression rates and qualifications? Available from https://www.hesa.ac.uk/data-and-analysis/students/outcomes

Hoffman, K. M., Trawalter, S., Axt, J. R., & Oliver, M. N. (2016). Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proceedings of the National Academic of Sciences, 113,* 4296-4301. https://doi.org/10.1073/pnas.1516047113

Iacobucci, G. (2020). Speciality training: Ethnic minority doctors' reduced chance of being appointed is "unacceptable". *The BMJ, 368,* m479. https://doi.org/10.1136/bmj.m479

IBM Corp. (2019). IBM SPSS Statistics for Windows, Version 26.0. IBM Corp.

Kaiser, C. R., Dover, T. K., Small, P., Xia, G., Brady, L. M., & Major, B. (2021). Diversity initiatives and White Americans' perceptions of racial victimhood. *Personality & Social Psychology Bulletin, 48,* 968-984. https://doi.org/10.1177%2F01461672211030391

Kmietowicz, Z. (2020a). NHS launches Race and Health Observatory after BMJ's call to end inequalities. *The BMJ, 369,* m2191. https://doi.org/10.1136/bmj.m2191

Kmietowicz, Z. (2020b). Are medical schools turning a blind eye to racism? *The BMJ, 368*, m420. https://doi.org/10.1136/bmj.m420

Lakens, D. (2021). Sample size justification. https://doi.org/10.31234/osf.io/9d3yf

Ledgerwood, A., Hudson, S. T. J., Lewis, N. A., Jr., Maddox, K. B., Pickett, C. L., Remedios, J. D., Cheryan, S., Diekman, A. B., Dutra, N. B., Goh, J. X., Goodwin, S. A., Munakata, Y., Navarro, D. J., Onyeador, I. N., Srivastava, S., & Wilkins, C. L. (2022). The pandemic as a portal: Reimagining psychological science as truly open and inclusive. *Perspectives on Psychological Science*. https://doi.org/10.1177%2F17456916211036654

Milner, A., Baker, E., Jeraj, S., & Butt, J. (2020). Race-ethnic and gender differences in representation within the English National Health Service: A quantitative analysis. *BMJ Open, 10,* e034258. http://dx.doi.org/10.1136/bmjopen-2019-034258

MIND. (2020). Racism and mental health. Available at: https://www.mind.org.uk/information-support/tips-for-everyday-living/racism-and-mental-health/

Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK. [MBRRACE-UK] (2018). Saving lies, improving mothers' care: Lessons learned to inform maternity care from the UK and Ireland confidential enquiries into maternal deaths and morbidity 2014-2016. Available at: https://www.npeu.ox.ac.uk/assets/downloads/mbrrace-uk/reports/MBRRACE-UK%20Maternal%20Report%202018%20-%20Web%20Version.pdf

Naqvi, H., Gabriel, M., & Adebowale, V. (2021). The critical role of the NHS Race and Health Observatory. *BMJ Leader, 0,* 1-2. https://doi.org/10.1136/leader-2021-000505

National Women's Council of Ireland (2015). *Recognising and challenging our unconscious bias: Sample training back.* National Women's Council of Ireland: Dublin, Ireland. Available at: http://www.nwci.ie/images/uploads/NWCI_Training_Pack_Final.pdf

NHS People Plan (2020/21). *We are the NHS: People plan for 2020/2021 – action for us all*. Available at: https://www.england.nhs.uk/publication/we-are-the-nhs-people-plan-for-2020-21-action-for-us-all/

NUS & Universities UK. (2019). Black, Asian, and Minority Ethnic student attainment at UK universities: #closingthegap. Universities UK. Available from: https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2019/bame-student-attainment-uk-universities-closing-the-gap.pdf

Office for Students (2019). *Differences in student outcomes*. Available from https://www.officeforstudents.org.uk/data-and-analysis/differences-in-student-outcomes/ethnicity/

Peters, M. A. (2018). Why is my curriculum white? A brief genealogy of resistance. In J. Arday & H. S. Mirza (Eds.), *Dismantling race in Higher Education* (pp. 253-270). Palgrave Macmillan.

Pryce-Miller, M., Bliss, E., Airey, A., Pennington, C. R. (*in press*). The lived experiences of racial bias for Black, Asian, and Minority Ethnic students in practice: A hermeneutic phenomenological study. *Nurse Education in Practice.*

Public Health England. (2020). Disparities in the risk and outcomes of COVID-19. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf

Royal College of Nursing. (2020). Second person protective equipment survey of UK Nursing staff report: Use and availability of PPE during the COVID-19 pandemic. Available at: https://www.rcn.org.uk/professional-development/publications/rcn-second-ppe-survey-covid-19-pub009269

Scammell, J. M., & Olumide, G. (2012). Racism and the mentor-student relationship: Nurse education through a white lens. *Nurse Education Today*,*32*, 545-550. https://doi.org/10.1016/j.nedt.2011.06.012

Schimmack, U. (2021). The Implicit Association Test: A method in search of a construct. *Perspectives on Psychological Science,* 1-19. https://doi.org/10.1177/1745691619863798

Smith, S. (2017). Exploring the black and minority ethnic (BME) student attainment gap: what did it tell us? Actions to address home BME undergraduate students' degree attainment. *Journal of Perspectives in Applied Academic Practice*, *5,* 48-57.

Stevenson, J., O'Mahony, J., Khan, O., Ghaffar, F., & Stiell, B. (2019). *Understanding and overcoming the challenges of targeting students from under-represented and disadvantaged ethnic backgrounds.* Report to the Office for Students. Available at: https://www.officeforstudents.org.uk/media/d21cb263-526d-401c-bc74-299c748e9ecd/ethnicity-targeting-research-report.pdf

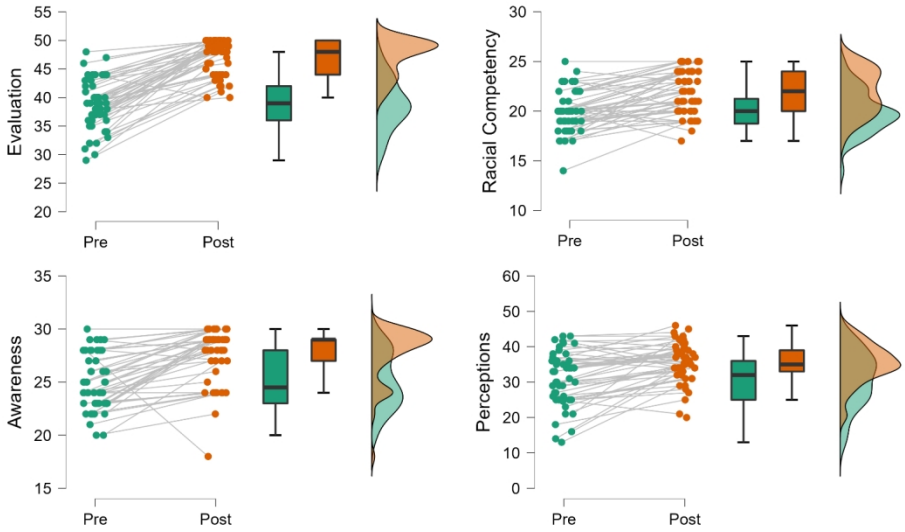
Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th Ed.). Pearson Education Ltd.

Watt, S. K. (2011). Moving beyond the talk: From difficult dialogues to action. In J. Armino, V. Torres, and R. Pope. *Why aren't we there yet: Taking personal responsibility for creating an inclusive campus.* Stylus Publishing.

WRES Implementation Team (2019). A model employer: Increasing black and minority ethnic representation at senior levels across the NHS. *NHS Workforce Race Equality Standard (WRES) leadership strategy.* Available from: https://www.england.nhs.uk/wp-content/uploads/2019/01/wres-leadership-strategy.pdf

WRES Implementation Team (2021). *2020 data analysis report for NHS trusts and clinical commissioning groups*. Available at: https://www.england.nhs.uk/wp-content/uploads/2021/02/Workforce-Race-Equality-Standard-2020-report.pdf

Yaya, S., Yeboah, H., Handy Charles, C., Out, A., & Labonte, R. (2020). Ethnic and racial disparities in COVID-19-related deaths: Counting the trees, hiding the forest. *BMJ Global Health, 5,* e002913. http://dx.doi.org/10.1136/bmjgh-2020-002913




A raincloud plot displaying pre- to post-training changes in training evaluations, racial competency, awareness, and perceptions of unconscious racial bias. Left = individual data points from pre- to post-training, middle = interquartile range and confidence intervals, right = data distribution.

145x85mm (300 x 300 DPI)

**Supporting Information File 1: Clarifications and deviations from preregistration**

1. In this research study we included an exploratory measure of *Institutional Responses of Racial Inequality* which was administered pre-training only. This measure is not reported in the current manuscript due to its focus and may be written into a separate commentary with an associated transparency statement.
2. The open-ended question "Do you have any suggestions as to how the training can be improved?" is not reported in the current manuscript. This was intended for us to improve the workshops based on participant's feedback and to report this to faculty. All data is provided in the OSF file.
3. The preregistration states that the timing of the unconscious bias workshops was 5-hours. However, the delivered workshops were 4-hours long. This means that the workshops may be slightly more time-effective, which has may have implications for their uptake/feasibility.
4. The procedure for dealing with missing data was not specified in the preregistration protocol. In the final manuscript, missing data was inputted using the mean for that particular questionnaire item ('mean imputation', <5% of cases: Tabacknick & Fiddell, 2012) prior to data analysis.
5. In the preregistration, we proposed to analyse the sub-scales of the General Perceptions of Bias scale (Girod et al., 2014) using a 3 x 2 ANOVA. However, the internal reliability of the personal (pre-training, $a$ = .59, post, $a$ = .48) and societal bias sub-scales (pre-training, $a$ = .54, post $a$ = .33) was poor, which is likely due to their short length (2 items in each) that violates tau-equivalence. We therefore created a total score across the personal, societal, and healthcare

sub-scales which resulted in excellent internal reliability (pre-training, *a* = .86; post-training, *a* = .75) and analysed this using the same analysis as the other outcome measures.

# Reporting checklist for randomised trial.

Based on the CONSORT guidelines.

## Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the CONSORTreporting guidelines, and cite them as:

Schulz KF, Altman DG, Moher D, for the CONSORT Group. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials

| | | Reporting Item | Page Number |
|---|---|---|---|
| **Title and Abstract** | | | |
| Title | #1a | Identification as a randomized trial in the title. | N/A: Empirical study (preregisered) not an RCT |
| Abstract | #1b | Structured summary of trial design, methods, results, and conclusions | 2 |
| **Introduction** | | | |

| | | | |
|---|---|---|---|
| Background and objectives | #2a | Scientific background and explanation of rationale | 8-9 |
| Background and objectives | #2b | Specific objectives or hypothesis | 8-9 |
| **Methods** | | | |
| Trial design | #3a | Description of trial design (such as parallel, factorial) including allocation ratio. | 10 |
| Trial design | #3b | Important changes to methods after trial commencement (such as eligibility criteria), with reasons | 10 |
| Participants | #4a | Eligibility criteria for participants | 10 |
| Participants | #4b | Settings and locations where the data were collected | 11 |
| Interventions | #5 | The experimental and control interventions for each group with sufficient details to allow replication, including how and when they were actually administered | 10-12 |
| Outcomes | #6a | Completely defined prespecified primary and secondary outcome measures, including how and when they were assessed | 12-14 |

| | | | |
|---|---|---|---|
| Sample size | #7a | How sample size was determined. | 10 |
| Sample size | #7b | When applicable, explanation of any interim analyses and stopping guidelines | N/A |
| Randomization - Sequence generation<br><br>N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. | #8a | Method used to generate the random allocation sequence. | |
| Randomization - Sequence generation<br><br>N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. | #8b | Type of randomization; details of any restriction (such as blocking and block size) | |
| Randomization - Allocation concealment mechanism | #9 | Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were | N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. |

| | | | |
|---|---|---|---|
| | | assigned | |
| Randomization - Implementation | #10 | Who generated the allocation sequence, who enrolled participants, and who assigned participants to interventions | N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. |
| Blinding | #11a | If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how. | 9 |
| Blinding | #11b | If relevant, description of the similarity of interventions | N/A |
| Statistical methods | #12a | Statistical methods used to compare groups for primary and secondary outcomes | 14-15 |
| Statistical methods | #12b | Methods for additional analyses, such as subgroup analyses and adjusted analyses | 14-15 |
| Outcomes | #6b | Any changes to trial outcomes after the trial commenced, with reasons | 10 |
| **Results** | | | |
| Participant flow diagram (strongly recommended) | #13a | For each group, the numbers of participants who were randomly | N/A: Pre-post repeated measures design |

| | | | |
|---|---|---|---|
| | | assigned, received intended treatment, and were analysed for the primary outcome | |
| Participant flow | #13b | For each group, losses and exclusions after randomization, together with reason | 10 |
| Recruitment | #14a | Dates defining the periods of recruitment and follow-up | 14 |
| Recruitment | #14b | Why the trial ended or was stopped | N/A |
| Baseline data | #15 | A table showing baseline demographic and clinical characteristics for each group | 15-18 AND FIGURE 1 |
| Numbers analysed | #16 | For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups | 15-18 |
| Outcomes and estimation | #17a | For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval) | 15-18 |
| Outcomes and estimation | #17b | For binary outcomes, presentation of both absolute and relative effect sizes is recommended | N/A |
| Ancillary analyses | #18 | Results of any other analyses performed, | 15-18 |

| | | | |
|---|---|---|---|
| | | including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory | |
| Harms | #19 | All important harms or unintended effects in each group (For specific guidance see CONSORT for harms) | 24 |
| **Discussion** | | | |
| Limitations | #20 | Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses | Throughout Discussion: 21-25 |
| Interpretation | #22 | Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence | 21-25 |
| Registration | #23 | Registration number and name of trial registry | 10 |
| Generalisability | #21 | Generalisability (external validity, applicability) of the trial findings | 21-25 |
| **Other information** | | | |
| Interpretation | #22 | Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence | 21-25 |
| Registration | #23 | Registration number and name of trial registry | 10 |

| | | | |
|---|---|---|---|
| Protocol | #24 | Where the full trial protocol can be accessed, if available | 10 |
| Funding | #25 | Sources of funding and other support (such as supply of drugs), role of funders | 1 |

Notes:

- 1a: N/A: Empirical study (preregisered) not an RCT
- 8a: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 8b: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 9: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 10: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 13a: N/A: Pre-post repeated measures design
- 15: 15-18 AND FIGURE 1
- 20: Throughout Discussion: 21-25 The CONSORT checklist is distributed under the terms of the Creative Commons Attribution License CC-BY. This checklist was completed on 30. September 2022 using https://www.goodreports.org/, a tool made by the EQUATOR Network in collaboration with Penelope.ai

BMJ Open

# A Mixed Methods Evaluation of Unconscious Racial Bias Training for NHS Senior Practitioners to Improve the Experiences of Racially Minoritised Students



| | |
|---|---|
| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2022-068819.R1 |
| Article Type: | Original research |
| Date Submitted by the Author: | 16-Dec-2022 |
| Complete List of Authors: | Pennington, Charlotte; Aston University<br>Bliss, Eleanore; University of the West of England<br>Airey, Alisha; University of the West of England<br>Bancroft, Mandy; University of the West of England<br>Pryce-Miller, Maxine; Coventry University |
| Primary Subject Heading: | Health policy |
| Secondary Subject Heading: | Health services research |
| Keywords: | EDUCATION & TRAINING (see Medical Education & Training), GENERAL MEDICINE (see Internal Medicine), HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Organisational development < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Human resource management < HEALTH SERVICES ADMINISTRATION & MANAGEMENT |
| | |

*I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.*

*The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.*

*Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.*

# A Mixed Methods Evaluation of Unconscious Racial Bias Training for NHS Senior Practitioners to Improve the Experiences of Racially Minoritised Students

Charlotte R. Pennington[1*], Eleanore Bliss[2], Alisha Airey[2], Mandy Bancroft[2], Maxine Pryce-Miller[3]

[1] School of Psychology, Aston University, Birmingham, U.K.

[2] Faculty of Health & Applied Sciences, University of the West of England, Bristol, U.K.

[3] School of Nursing, Midwifery and Health, University of Coventry, U.K.

*Correspondence concerning this article should be addressed to: Dr Charlotte R. Pennington, School of Psychology, Faculty of Health & Life Sciences, Aston University, Birmingham, B4 7ET. E-mail: c.pennington@aston.ac.uk ORCID ID: https://orcid.org/0000-0002-5259-642X

**Key words:** degree awarding gap; racial inequality; unconscious bias; higher education; healthcare practice; unconscious bias training.

## Abstract

**Objective:** The degree awarding gap indicates that racially minoritised higher education students receive lower degree classifications relative to their White peers. Whilst the reasons for this are complex, research suggests that educator and practitioner attitudes and behaviour towards racially minoritised students are a contributing factor. This preregistered study evaluates the effectiveness of unconscious racial bias training (URBT) to enhance NHS Senior Practitioner's recognition of how racial inequalities negatively impact racially minoritised students. **Design:** A mixed methods study with a pretest-posttest design was conducted in the higher education and healthcare practice environment. **Methods:** Forty-nine Senior Healthcare Practitioners completed a 4-hour URBT workshop with activities focusing on activating stereotypes, exploring differences between unconscious and implicit bias, discussing the development of bias, and reflecting on student experiences of prejudice, harassment, and discrimination. They completed pre- and post-quantitative measures that assessed the effectiveness of URBT and changes in racial competency, awareness and perceptions of unconscious racial bias. Qualitative measures explored the usefulness and perceived applications of URBT, and a one-month follow-up gauged how it had been applied within practice. **Results:** Participants reported positive evaluations of URBT, higher perceived racial competency, awareness and perceptions of racial bias ($ps < .001$, $dz > .35$). After one-month, key themes from qualitative responses suggested that participants had increased self-awareness and were exploring how to set up mentoring and working groups, change recruitment and progression processes, and diversify the taught curriculum. **Conclusions:** URBT may be one effective strategy to enhance awareness and encourage reflections of racial bias. We discuss how reducing racial inequalities requires a multi-faceted approach that affords upfront conversations about systemic racism, implements effective initiatives, policies and procedures, and engages in continuous evaluation.

**Strengths and Weaknesses**

- (+) In line with recommendations, unconscious racial bias training was delivered to NHS Senior Practitioners in the practice and higher education environment and focused explicitly on increasing awareness of and concern about racial bias. NHS Senior Practitioners are in leadership and management positions that allow them to implement significant changes, so this targeted population represents a strength of our research.
- (+) We utilised a mixed methods approach to evaluate the training, gathering both quantitative and qualitative outcome measures, as well as exploring how the training had been implemented in practice one-month later.
- (-) Our study assessed self-report evaluations and perceptions but did not assess longer-term objective measures of behaviour change (e.g., changes in student attainment, staff retention, progression, and disciplinary hearings for racially minoritised individuals).
- (-) Research suggests that the effectiveness of training may decay over time so a longer or additional follow-up period would be fruitful (however, this can introduce an equitable challenge of greater response attrition).

## Introduction

*"The NHS was established on the principles of social justice and equity. In many ways, it is the nation's social conscience, but the treatment of our colleagues from minority groups falls short far too often". (NHS People Plan, 2020/21, pp. 23).*

Racial inequalities persist within education, healthcare, and workplace settings in the United Kingdom. As students, racially minoritised individuals are awarded significantly lower degree classifications than their White peers (1–3). As healthcare patients, they have poorer access to services, receive inadequate treatment, and their mortality rates are higher (4–7). As healthcare practitioners, they experience racial discrimination and harassment, report more risks to their personal safety, are less represented at senior levels, and face more obstacles in their career progression (8–11). As reported in the British Medical Journal's special issue on "*racism in medicine*", these statistics have remained stable over the past twenty years and require urgent action (12,13). The National Healthcare Service (NHS) have responded to these concerns, outlining their commitment to addressing racial inequalities for staff, students, and patients through the Workforce Race Equality Standard (14), NHS People Plan (15), and Race and Health Observatory (16,17). Despite these reports showing some signs of progress, the NHS recognise that continuous improvement is required for them to become a fully inclusive, equitable and fair organisation.

The U.K Government has also announced that it demands improvements to the experiences and attainment of racially minoritised[1] students in higher education, putting the spotlight on the sector to explore factors involved in the 'degree awarding gap' and make a genuine pledge to reduce racial disparities (18,19). The degree awarding gap indicates the

[1]The term 'Black, Asian and Minority Ethnic (BAME)' is commonly used in research and society but is seen as problematic because it indiscriminately groups people from different geographical, behavioural, social, and cultural backgrounds (creating 'othering'). For this reason, in this article we use the term 'racially minoritised' which represents people who are from the global majority but who have systemically been minoritised based on their race.

percentage point difference between the proportion of U.K domiciled racially minoritised students awarded a first or 2:1 degree classification upon graduation (1). Despite holding equivalent entry qualifications, these students are approximately 13% less likely to be awarded a 1st or 2:1 grade compared to their White peers, which is significantly greater than that of all other student groups (1–3). This increases to 23% when looking at Black students exclusively, resulting in a 'leaky pipeline' with Black students 1.5 times more likely to discontinue their studies compared to any other racial group (3). Importantly, these disparities are suggested to be caused by the higher education environment itself, with racially minoritised students reporting problems relating to the academic environment, curriculum, assessment practice and academic support (20–22). They also report experiences of microaggressions – defined as subtle or offensive comments, action, or inaction directed at a minority group (23,24) – that adversely impacts their sense of belonging, confidence, mental health, and progression at university (25–28).

Students studying for a healthcare degree (e.g., Nursing, Midwifery) in the U.K often undertake clinical practice placements alongside their studies. However, these placements have been found to be racially hostile environments that present a daunting prospect for racially minoritised students (29,30). The Equality and Human Rights Commission (19) report that 56% of students have been racially harassed whilst on placement or within the university campus. Despite this, many universities are slow and sometimes unresponsive to act: a freedom of information request indicated that, out of 40 medical schools in the U.K, only half collected data on students' complaints regarding racism and racial harassment (31). Shockingly, data also indicates that out of 60,000 students across the U.K who made a complaint of racial harassment to their university in 2015/16, only 560 were officially recorded (19). Similar trends are also evident in the workplace. Data from the NHS Workforce Race Equality Standard report (14) shows that 15.3% of racially minoritised staff experience

discrimination from their colleagues compared to only 6.4% of White staff, with this disparity present within 82.7% of NHS Trusts. Furthermore, only 40.7% of racially minoritised staff believe that their organisation provides equal opportunities for career progression or promotion compared to 88.3% of White staff, which is reflected in their representation with only 9.2% in senior management roles. Combined, racial inequalities within higher education and healthcare practice disproportionately impact the achievement, retention, and progression of racially minoritised students and staff and reflect the broader issue of systemic racism within U.K society (29).

Although the reasons for the degree awarding gap are complex and multi-factorial, research suggests that educator and practitioner attitudes and behaviour towards racially minoritised students are a significant contributing factor (32,33). Bhopal and Pitkin (32) explain how the enactment of the Race Equality Charter – a measure recently introduced to address racial inequalities in higher education – actually works to enhance the reputation of the sector rather than tacking structural disadvantages faced by racially minoritised students. This can also be seen in the way the degree awarding gap is discussed, and the interventions put forward to mitigate it. Specifically, the apparent differences in academic achievement between racially minoritised and White students are often portrayed through a deficit model. This model focuses on the personal attributes and characteristics of racially minoritised students (e.g., their perceived lack of skills, knowledge, or experience) as explanations for attainment differences, therefore ascribing blame to the students themselves rather than an environment which perpetuates structural and institutional racism (1,32). This is acknowledged by the NHS who state that efforts to improve racially minoritised staff representation at more senior levels have been overshadowed by an "over-focus on the deficit model; the notion that there are inherent weaknesses or deficits amongst BAME staff themselves, rather than deep-rooted issues within organisations" (34, pp. 11).

The persistent evidence of racial inequalities for minoritised students and staff, coupled with global events such as the murder of George Floyd, have prompted universities and the NHS to address their roles in perpetuating racism and inequality. Task forces have been set up across the U.K and U.S to confront racism and to decolonise the taught curriculum, and statements have been disseminated by universities to signal a commitment to anti-racist actions (35–37). Although these initiatives make it seem like progress is being made, many of them are inadequate, are implemented without input from racially minoritised individuals, do not lead to sustained change, and can lead to high-status group members reacting defensively (32,38–41). One active step has been to recommend that educators and healthcare practitioners undergo unconscious bias training (also referred to as 'diversity training'; 19,20,42), which aims to teach people about the snapshot judgements we make about others and how this can impact upon our attitudes and behaviour (43). The goal of this training is to encourage people to acknowledge their biases and consider their source, whilst also exploring proactive steps that they can take to promote an inclusive environment and challenge racism.

A large-scale evaluation (42) found that across 18 studies, unconscious bias training (UBT) was effective for awareness raising and reduced unconscious bias within advanced training designs (e.g., 44,45). However, this report also highlighted that there was typically no long-term impact on behaviour following UBT, as well as the potential for the training to backfire when it is implied that stereotypes and biases are unchangeable. At first glance, this report seems to conclude that there is insufficient evidence to indicate that UBT is effective for behaviour change, however the authors propose two main reasons for the mixed findings to date: 1) research examining behaviour change is limited, and 2) methods for evaluating behaviour change mostly have low validity in that they do not measure actual observed change. Another review (46) states that the current evidence base is hindered by examining the effectiveness of UBT in university student populations and U.S based settings, suggesting

that there is a need for robust, repeated behavioural studies of UBT interventions in U.K workplaces. Others have suggested that diversity initiatives, such as UBT, should be improved to focus on explicitly increasing awareness of and concern about racial bias, planting seeds that inspires continued learning, and teaching strategies that allow participants to change their behaviour (47).

Informed by these recommendations, we developed and evaluated an unconscious racial bias training (URBT) workshop delivered to NHS Senior Practitioners in the practice and healthcare environment. The implementation of this training represents a coordinated effort between the NHS and U.K higher education to enhance awareness of how racial inequalities negatively impact racially minoritised as one strategy to reduce the degree awarding gap. The overarching research question centres on whether URBT is effective in increasing knowledge, perceptions and awareness of racial bias, and can lead to a process of reflection and change. The following hypotheses were preregistered:

H1: *Evaluation of training*. There will be an increase in positive evaluations of unconscious bias training from pre- to post-training suggesting that the training increased understanding of unconscious racial bias and willingness to engage and promote the training.

H2: *Racial competency*. There will be an increase in racial competency (i.e., racial beliefs and self-efficacy) from pre- to post-training suggesting that the training encouraged practitioners to reflect on their beliefs around race and how these impact mentoring, supervision, and interactions with racially minoritised students/staff.

H3: *Awareness of unconscious bias*. There will be an increase in awareness of unconscious racial bias from pre- to post-training suggesting that the training enhanced recognition, awareness, and the impact of unconscious racial bias on racially minoritised students/staff.

H4: *General perceptions of bias*. There will be an increase in perceptions of personal, societal, and professional bias from pre- to post-training suggesting that the training made people reflect more globally about these forms of bias and how they affect decision-making.

As well as examining immediate pre-post changes, we also assessed qualitative responses regarding the usefulness of the training and explored the degree to which participants had applied this in practice one-month later.

## Method

### Data Availability & Transparency Statement

The design and analysis plan were preregistered via the AsPredicted.org template on the Open Science Framework (https://osf.io/5w8fc). All materials, anonymised data, and analysis syntax are publicly available, as well as a statement outlining any necessary deviations to the preregistration protocol (48; https://osf.io/yfa6s/).

### Patient and Public Involvement

Patients or the public were not involved in the design, conduct, reporting, or dissemination plans of this research.

### Design

A quasi-experimental pretest-posttest design was combined with an explanatory mixed methods approach (49). The quantitative component comprised immediate pre- and post-questionnaire measures and a one-month follow-up questionnaire to evaluate the effectiveness of URBT. The qualitative component included open-ended questions regarding the usefulness and applications of the training. The URBT workshop and its evaluation were developed in line with recent large-scale evaluations (42,46,47): specifically, we ensured that the training was: 1) explicitly aimed at increasing understanding and awareness of unconscious racial bias, 2) tailored to the healthcare environment; 3) discussed the impact on racially minoritised

students and staff; 4) acknowledged potential feelings of discomfort and their importance; 5) explored strategies to mitigate bias with a focus on behaviour change; and 6) included a follow-up to assess the application of training in practice. Outcome measures were selected based on their previously demonstrated rigour (42).

**Participants**

Ethical approval was granted by the lead research institute (REF: HAS.20.02.136) and all participants provided informed written consent. Senior Nursing and Midwifery Practitioners from two NHS Trusts and a higher education institute were recruited via opportunity sampling to attend URBT. Our sample size justification was therefore based exclusively on resource constraints: specifically, the number of individuals who agreed to participate in the training. Sixty-one participants provided pre-training responses for our primary outcomes, but six of these were excluded due to duplicate identifiers and five for not providing matching post-training responses. This resulted in a final sample size of 49 participants ($M_{AGE}$ = 45.31, *SD* = 10.20) of whom 41 identified as female and White British. Thirty-three were Nurses, nine Midwives, three Higher Education Lecturers, and four from other separate (and therefore anonymised) healthcare roles. The majority of the sample reported that they had been in their profession for 15 years or more (61.2%), followed by 11-15 years (12.2%). Of this sample, 98% reported having completed 'Equality & Diversity' training at some point within their career.

Sensitivity power analyses were conducted in G*Power (50) to assess the minimum effect size we could reliably detect with our final sample size across a range of statistical power levels. This indicated that for repeated measure analyses of pre- to post-training outcomes, we had 80% power to detect a moderate effect size of Cohen's $d_z$ = .41 and 90% statistical power to detect $d_z$ = .47.

## Procedure

An email was sent to the Senior Management Team within two NHS Trusts and a higher education institute requesting that staff sign-up to an URBT workshop. Participants signed up to one of 16 workshops, which were delivered online via Microsoft Teams due to the restrictions imposed by the COVID-19 pandemic. The workshops were developed and led by two individuals who identify as a Black British and White British female and limited to groups of 10 participants to encourage engagement and active discussion. Participants were informed that the learning objectives of the training were: 1) "To *know*: what unconscious bias is and how it impacts the people around us", 2), "To be *aware:* of the barriers our own unconscious bias can create for the people around us, and 3) "To *do*: commit to a change in practice". Each training workshop was approximately four hours long and included seven main activities that focused on activating stereotypes, exploring the difference between unconscious and implicit bias, defining key terms (affinity bias, halo effect, in/out-groups, stereotypes, confirmation bias and group attribution), discussing the development of bias, and reflecting on experiences of prejudice, harassment, and discrimination (materials: https://osf.io/yfa6s/). After each activity, the trainers engaged in reflections, group discussions, and question-and-answers. At the end of the training, participants were presented with key statistics regarding racial inequality from the NHS WRES (34) and completed a quiz to reinforce their learning.

## Primary Outcome Measures

The following measures were administered both pre- and post-training.

### *General Training Evaluation*

We adapted a general evaluation questionnaire using in a previous training evaluation (51), which included 10 statements such as "I feel comfortable participating in this training". Responses were recorded on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) and resulted in acceptable internal reliability both pre- (Cronbach's $a$ = .78) and post-training

(*a* = .87). A total score was calculated for each timepoint (range 10-50), with higher scores representing more positive evaluations of the training. After the questionnaire, participants completed open-ended questions that asked: "What did you find the most useful and why?" and "How will you apply this training in practice?".

***Racial Competency***

Racial competency was measured using an adapted version of the cultural beliefs and self-efficacy sub-scale from the Cultural Competency Questionnaire (52). The term 'culture' was replaced to ask specifically about race. This questionnaire includes six statements such as "students/staff may identify with more than one racial group" recorded on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The questionnaire resulted in low internal reliability for pre-training responses due to the item "I am aware of the limits of my competency when interacting with students/staff who are a different race to me". Removal of this item improved reliability for pre-responses (*a* = .61) and was therefore removed for post-responses to allow comparison (*a* = .64). A total score was calculated for each timepoint (range 5-25), with higher scores representing greater perceptions of racial competency.

***Awareness of Unconscious Bias***

Participants were asked "Have you ever heard of the term 'unconscious bias'?" and if they responded "Yes" were asked to define it. Perceived awareness and attitudes regarding unconscious bias were then measured using the Attitudes Towards Unconscious Bias Scale (51). This questionnaire included six statements such as "Mentors can have biases about students/staff of which they are unaware" recorded on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The questionnaire resulted in acceptable internal reliability both pre- (*a* = .80) and post-training (*a* = .82). A total score (range 6-30) was calculated for each timepoint, with higher scores representing greater awareness of unconscious bias.

### *Perceptions of Bias*

Perceptions of bias were measured using an adapted version of the General Perceptions of Bias scale (53). This questionnaire included eight statements with three sub-scales of personal bias ("In most situations, I am objective in my decision making), societal bias ("People in today's society tend to treat people of different social groups equally"), and healthcare bias ("In healthcare practice, racial bias is no longer a problem in hiring decisions"). Responses were measured on a 6-point Likert scale (1 = Strongly Disagree, 6 = Strongly Agree), allowing for consistency with the other scales, and then reversed (see 52). The questionnaire resulted in acceptable internal reliability both pre- ($a$ = .86) and post-training ($a$ = .75). A total score (range 8-48) was calculated for each timepoint with higher scores representing greater perceptions of bias (i.e., more 'disagree' responses).

## Exploratory Outcome Measures

The following exploratory measure was administered post-training only.

### *Applications of Training in Practice*

Approximately one-month after the training, participants were sent a follow-up questionnaire that asked them to reflect on how they had applied the training in practice and were asked to return this within 3-weeks. This was registered as an exploratory outcome measure because we expected a relatively high attrition rate with the survey being distributed via email. First participants were asked: "Do you believe you have been successful in applying the training within your practice?", responding either "Yes" or "No". In line with (52), they then responded to seven statements such as "since the unconscious bias training workshop I have reflected on how my biases may affect student/staff mentoring" on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). This questionnaire resulted in excellent internal reliability ($a$ = .92). Participants then responded to three open-ended questions that asked: "Since learning about unconscious bias, in what way do you think that this might influence your practice?",

"How have you applied the training in your practice?" and "Have you had any difficulties/challenges in applying this training in your practice?".

**Analytical Strategy**

Analyses were conducted in SPSS (v.26; 54). Missing questionnaire data was inputted using the mean for that particular questionnaire item ('mean imputation', <5% of cases: 55). Confirmatory analyses assessed changes in evaluations, racial competency, awareness, and perceptions of unconscious racial bias from pre- to post-training. These were each analysed using a repeated measures Analysis of Variance (ANOVA) with an alpha level of .05 used to determine statistical significance. In line with previous research (52) we report the percentage of agreement/disagreement with each statement for the General Training Evaluation and the Applications of Training in Practice measures. Reflexive thematic analysis (56,57) was employed to code responses to the open-ended questions and develop key themes. In this process, coding is recognised as a subjective process that requires a reflexive researcher who strives to reflect on their assumptions and how these might shape and delimit their coding. It includes the phases of familiarisation, coding, generating initial themes, reviewing and developing themes, refining, defining, and naming.

## Results

### Primary Outcomes

***Evaluation.*** There was a significant increase in positive evaluations of unconscious bias training from pre- ($M$ = 38.71, $SD$ = 4.37) to post-training ($M$ = 47.08, $SD$ = 3.09), $F(1, 48) = 210.20$, $p < .001$, $\eta p2 = .81$, $d_z = 2.08$. As can be seen in Table 1, the training was evaluated positively, with the majority of participants responding "Agree" or "Strongly Agree" to each item. In support of Hypothesis 1, this suggests that the training increased understanding of unconscious racial bias and willingness to engage and promote the training.

Table 1. *Percentage of agreement/disagreement with each item of the training evaluation (post-training responses only).*

| | SD | D | N | A | SA |
|---|---|---|---|---|---|
| 1. I felt comfortable participating in this training. | - | - | 2.0% | 32.7% | 65.3% |
| 2. This training is relevant to me in my own work. | - | - | - | 16.3% | 83.7% |
| 3. I have an understanding of unconscious racial bias. | - | - | - | 26.5% | 73.5% |
| 4. I have an understanding of the negative impact of unconscious racial bias. | - | - | - | 30.6% | 69.4% |
| 5. I have an understanding of the benefits of addressing unconscious racial bias. | - | - | - | 22.4% | 77.6% |
| 6. I have an understanding of techniques to reduce my own unconscious racial bias. | - | - | 10.2% | 57.1% | 32.7% |
| 7. I have a clear idea of how I will apply the learning from this training in my own role. | - | - | 8.2% | 40.8% | 51.0% |
| 8. I would recommend this training to other colleagues. | - | - | - | 8.2% | 91.8% |
| 9. I would recommend this training to senior management. | - | - | - | 6.1% | 93.9% |
| 10. This training is useful. | | | | 10.2% | 89.8% |

Four main themes were identified from the open-ended question "what did you find the most useful and why": 1) reflections of unconscious racial bias; 2) lived experiences of discrimination, 3) a non-judgemental, open space, and 4) prompting reflections of making a positive change. Three main themes were identified from the question "how will you apply this

training in practice?": 1) confronting racial bias; 2) enabling conversations about race; and 3) enacting real change. Example excerpts are provided in Table 2.

Table 2. *Key themes from open-ended responses to the evaluation questionnaire.*

| ***"What did you find the most useful and why?"*** | | | |
|---|---|---|---|
| **Theme 1: Reflections of unconscious bias** | **Theme 2: Lived experiences of discrimination** | **Theme 3: A non-judgemental, open space** | **Theme 4: Making a positive change** |
| "Facilitated reflection of own lack of knowledge of the subject and individuals' experiences, which was distressing at times." | "Real examples of the struggle/ discrimination BAME staff have/experience in the workplace." | "Safe discussions around common misconceptions and issues - built confidence in exploring these themes." | "Very uncomfortable learning but absolutely essential to make any changes moving forwards. The more open we are, the more we can learn and take positive steps." |
| "considering our personal unconscious bias and the impact on our professional lives." | "the student narrative was particularly powerful." | "I felt comfortable and able to express myself and explore the issues and challenges." | "It was also helpful in terms of application to academic practice - for example, thinking about how to have conversations about race with staff in practice." |
| "it was thought provoking in terms of understanding unconscious bias and reviewing how our own values and beliefs might impact on our practice." | "the student stories. this had the most impact on my understanding of how real and prevalent this pro[b]lem still is." | "Being able to talk freely about experiences, knowing that it was a safe space without judgement and ask questions." | "I'm very keen on looking at the deficit model as how I can implement change and overcome barriers within recruitment and development opportunities." |
| ***"How will you apply this training in practice?"*** | | | |
| **Theme 1: Confronting racial bias** | **Theme 2: Enabling conversations about race** | **Theme 3: Enacting real change.** | |
| "*Addressing* my language that I use with students if they come to me with an issue related to racial discrimination". | "*Encouraging* student conversations about this, dedicating time and space to exploring practice related challenges with the students." | "*Reviewing* and amending teaching materials to ensure that there is representation and including voices that is missing from the information presented." | |
| "I will speak more openly about discrimination, listen to each individual's experience. Raise/escalate concerns. Have difficult conversations and continue to listen and be aware of my own unconscious bias." | "Encourage conversations on the ward regarding race and experience of our BME members of staff - to formalise this process on the back of […] risk assessments and ask staff how it is to work on my unit as a member of staff from their background/heritage to explore potential issues and understand their perspective". | "Work with the Equality, Diversity and Inclusion lead, alongside the Nursing and Midwifery team to review applications, career opportunities and working to always include the those whose associate themselves as BAME origin with policy changes and ideas." | |
| "I will be more aware of my own unconscious bias, taking techniques forward to one-to-one and new staff inductions/training. I will ensure I feel more | "engage with BAME staff to understand more their lived experiences of unconscious bias and prejudice. Engage with students to help empower them | "I will use it in recruitment, education, engagement with students, engaging with the BME forum and promoting this to staff, engaging with the LEF team when | |

| | | |
|---|---|---|
| comfortable talking about race and religion to people of all backgrounds." | more to seek help if they are experience racial prejudice." | students raise concerns." |

***Racial Competency.*** There was a significant increase in perceptions of racial competency from pre- ($M$ = 19.85, $SD$ = 2.14) to post-training ($M$ = 21.81, $SD$ = 2.17), $F(1, 47) = 37.63$, $p < .001$, $\eta p2 = .45$, $d_z = .88$. In support of Hypothesis 2, this suggests that the training encouraged participants to reflect on their beliefs around race and how these impact mentoring, supervision, and interactions with racially minoritised students and staff.

***Awareness of unconscious bias.*** There was a significant increase in awareness of unconscious bias from pre- to post-training: more participants reported that they recognised this term ($M_{PRE}$ = 89.13[%], $SD$ = 31.47, $M_{POST}$ = 100.00[%], $SD$ = .00), $F(1, 45) = 5.49$, $p = .02$, $np2 = .11$, $d_z = .35$, and reported that they were more aware of its impact on staff and students ($M_{PRE}$ = 25.00, $SD$ = 2.63, $M_{POST}$ = 27.65, $SD$ = 2.59), $F(1, 47) = 40.60$, $p < .001$, $\eta p2 = .46$, $d_z = .92$. In support of Hypothesis 3, this suggests that the training increased overall awareness of unconscious bias.

***Perceptions of bias.*** There was a significant increase in perceptions of bias from pre- ($M$ = 30.92, $SD$ = 7.69) to post-training ($M$ = 35.74, $SD$ = 5.23), $F(1, 47) = 29.27$, $p < .001$, $\eta p2 = .38$, $d_z = .78$. In support of Hypothesis 4, this suggests that the training increased perceptions of personal, societal, and professional bias and how they affect decision-making. Figure 1 displays the pre- and post- primary outcome measures.

[**Figure 1.** A raincloud plot displaying pre- to post-training changes in training evaluations, racial competency, awareness, and perceptions of unconscious racial bias. Left = individual data points from pre- to post-training, middle = interquartile range and confidence intervals, right = data distribution.

## Exploratory Outcomes

After exclusion of duplicate or missing participant identifiers ($n$ = 9), a total of 17 participants were matched to the one-month follow-up questionnaire. Of this sample, 76.5% responded "Yes" to the question "Do you believe you have been successful in applying the training within your practice?". As can be seen in Table 3, the majority of participants responded 'Agree' or 'Strongly Agree' to six out of the seven questions; however, for the question "I have noticed a positive change in the way that students/staff respond to my mentoring", the majority responded with "Neither agree nor disagree".

Table 3. *Percentage of agreement/disagreement with each item of the one-month follow-up questionnaire.*

| | SD | D | N | A | SA |
|---|---|---|---|---|---|
| 1. [I have…] applied the knowledge learnt to my own practice. | - | - | 11.8% | 58.8% | 29.4% |
| 2. Been aware of how my biases may impact student/staff mentoring. | - | - | - | 47.1% | 52.9% |
| 3. Reflected on how my biases may affect student/staff mentoring. | - | - | 5.9% | 52.9% | 41.2% |
| 4. Created new habits to explore my unconscious biases. | - | 5.9% | 11.8% | 52.9% | 29.4% |
| 5. Noticed a positive change in the way that students/staff respond to my mentoring. | - | - | 64.7% | 11.8% | 23.5% |
| 6. Been able to share what I learned with other colleagues. | - | - | 5.9% | 35.3% | 58.8% |
| 7. Been able to discuss race more confidently. | - | - | 11.8% | 52.9% | 35.3% |

Four themes were identified from the open-ended questions "since learning about unconscious bias, in what way do you think that this may influence your practice?" and "how have you applied the training in your practice?". The themes identified were: 1) setting up mentoring and working groups, 2) changing the recruitment and progression process, 3), increased self-awareness, and 4) diversifying the taught curriculum. Example excerpts are provided in Table 4.

Table 4. *Key themes from open-ended responses to the 'Applications of training in practice' questionnaire.*

| ***"Since learning about unconscious bias, in what way do you think that this might influence your practice?" and "How have you applied the training in your practice?"*** | | | |
|---|---|---|---|
| **Theme 1: Setting up mentoring & working groups** | **Theme 2: Changing the recruitment & progression process** | **Theme 3: Increased self-awareness** | **Theme 4: Diversifying the taught curriculum** |
| "Trying to implement change through listening to other people's views. such as creating working groups to answer questions about making services more accessible". | "It has made me think about our recruitment process and how we advertise posts. Also i have done some interviews and it has made me more awa[r]e of the ques[t]ions I am asking and how others interpret these. I defin[i]tely have a better understanding of my unconscious bias and how that has influen[c]ed decisions in the past. I have shared what I learnt with my team, and this has been really powerful". | "It has changed the way I think and perceive people. Being an [RACE REDACTED], I have faced a lot of bias myself and I clearly understand how it feels. I might have had biases against people which I was not aware of. This training has helped me be more conscious about my thoughts. Even when I talk to students, I am conscious of my body language and words that I use so that I don't make them uncomfortable. I think it was the best decision to attend the training". | " I am explicitly including sessions about race and bias in modules eg in a palliative care module this autumn I have added "Approaches to death and dying in different cultures" and will be asking the students to consider how this is viewed in the wards they have worked on". |
| "I am looking for my teams to provide mentoring and coaching to our BAME staff to support their leadership development and application". | IN my recruitment campaigns. In my attitudes towards the recruitment process and my thoughts on mentoring students. | "It has made me more aware of how what is said may have a cumulative effect on staff members, even if comments or questions are intended in a friendly or curious way e.g. micro aggressions" | "my inclusion of bias (conscious and unconscious) will be more explicit in my lesson planning (rather than implied). I am part of a working group that will be considering assessment and am very conscious of the need to actively explore the reasons for the attainment gap". |
| "i want to set up a focus group to look at how we can provide suitable infant feeding support for black mothers. i want to engage with b[la]ck staff to explore their experiences w[o]rking in our dept". | "i want to challenge recruitment specifically in recruitment of MSWs [Medical Social Workers]". | "This will influence the content of my teaching sessions and interactions with students. It has influenced the language that I use and the slight increase in confidence I have gained in opening conversations about race". | Ensuring that each contact made with students discusses all the topics raised in the training in a "discussion base. I have also added to my materials on slides etc" |

## Discussion

The degree awarding gap indicates that racially minoritised students receive lower degree classifications relative to their White peers, and this is coupled with experiences of racial prejudice and discrimination in higher education and the placement/practice environment. Research suggests that educator and practitioner attitudes and behaviour towards racially minoritised students are a significant contributing factor (32,33) and should be a focus of racial equality initiatives. The current study evaluated the effectiveness of unconscious racial bias training (URBT) delivered to NHS Senior Practitioners to enhance awareness of how racial inequalities negatively impact racially minoritised students. Findings indicate that participants reported overall positive evaluations of URBT and higher perceived racial competency, awareness of unconscious racial bias and perceptions of bias after the training. Qualitative responses suggest that participants had increased self-awareness and were exploring how to set up mentoring and working groups, change recruitment and progression processes, and diversify the taught curriculum. These findings suggest that URBT may be one effective strategy to increase knowledge, perceptions, and awareness of racial bias in the higher education and healthcare practice environment and lead to a process of reflection and change.

Previous research has found mixed findings with regards to the effectiveness of UBT (42,46), and several recommendations have been put forth to improve it (46,47). Informed by these, we developed and evaluated an URBT workshop that was explicitly aimed at increasing understanding and awareness of racial bias, tailored to the healthcare setting, discussed the impact of prejudice and discrimination on racially minoritised students and staff, acknowledged feelings of discomfort, and explored actions to mitigate bias. To assess (short-term) change, we also surveyed participants one-month after the training to ask how they had implemented their learning in practice. These preliminary positive findings suggest that UBRT

may be more effective when developed in line with these recommendations, and these should be considered in the development and implementation of future training interventions.

Participant's qualitative responses provide further insight into useful aspects of the training, which can inform future training workshops. Two of the themes suggested that the training was useful because it *facilitated reflections of unconscious bias and* highlighted *lived experiences of discrimination.* The focus on the student narrative allowed participants to "consider their unconscious bias" and "review how [their] values and beliefs might impact on practice". A third theme suggested that the *non-judgemental, open space* was useful because it fostered "safe discussions around common misconceptions" and allowed people to "explore issues and challenges" and "talk freely about experiences". This may have helped to overcome defensive reactions towards bias, which can occur as an unintended consequence of diversity initiatives (39,41). Finally, participants suggested that the training prompted *reflections of making a positive change,* such as "thinking about how to have conversations about race with staff in practice" and "looking at the deficit model to implement change and overcome barriers with recruitment and development opportunities". These excerpts support the notion that URBT should be action-oriented so that raised awareness of racial bias is coupled with strategies to mitigate it (47).

Participants also responded positively when asked about how they would apply this training in practice, with three themes centering on *confronting racial bias, enabling conversations about race,* and *enacting real change.* However, it's important to note that these responses were gathered immediately after the training, so it is more informative to focus on responses to the one-month questionnaire. Here, the majority of participants agreed that they had applied the knowledge learnt to their own practice, reflected on how their biases may affect student/staff mentoring, created new habits to explore unconscious biases, and been able to discuss race more confidently. They also strongly agreed that they had been aware of how their

biases may impact student/staff mentoring and were able to share what they had learned with other colleagues. Nevertheless, participants were also neutral with regards to noticing a positive change in the way that students/staff had responded to their mentoring. This may reflect the short follow-up period in which participants were asked this question, highlighting the need for continuous, long-term evaluations to ensure that URBT has its intended impact of negating racial inequalities.

At this stage, four themes were also identified which were *setting up mentoring and working groups*, *changing the recruitment and progression process*, *increased self-awareness*, and *diversifying the taught curriculum*. The first theme showed how participants were exploring how to "provide mentoring to our BAME staff to develop their leadership development", "listening to other people's views" to implement change, and "setting up a focus group to […] support Black mothers" and "engage with Black staff". Within the second theme, participants expressed how the training had made them "think about recruitment processes" and "challenging" these to be more equitable. A general theme throughout these quotes was increased self-awareness of perceptions towards racially minoritised students and staff, for example being "more aware of how what is said may have a cumulative effect on staff members" and the impact of implicit behaviour such as "body language" and "microaggressions". The final theme indicated that the training had encouraged participants to diversify the taught curriculum, with excerpts focusing on "including sessions about race and bias in modules" and ensuring that the "inclusion of bias [is] more explicit in lesson planning", and the need to "actively explore the reasons for the attainment gap". These themes are encouraging given that the training was targeted at staff in senior management roles who hold the power to make substantial changes in the NHS and higher education environment.

## Limitations & Future Directions

The main limitation of the current study is a common one in the literature on unconscious bias training: our outcome measures focused on the training's usefulness, post-intervention knowledge, and putative planned behaviours rather than actual behaviour change. Research has suggested that training effects can decay over time (58) and longitudinal studies are therefore required to assess the sustained effectiveness of this training with more objective indicators (e.g., changes in student attainment, staff retention, progression, and disciplinary hearings). A recent study provides a gold-standard example of this, assessing whether a training workshop reduced racial microaggressions through simulated interracial patient encounters (59). As a positive early indicator of change, the current research has nevertheless informed the development of an anti-racism framework within one NHS Trust. This framework was coproduced with healthcare staff and focuses on six key principles of leadership, policy, transparency, wellbeing and belonging, employment, and education. It aims to provide a resource for management and individual staff members to facilitate individual accountability and monitor actions towards being an anti-racist colleague and organisation. A longer-term evaluation of this framework is planned.

It is also important to note that, although the majority of qualitative responses were positive, some participant's quotes revealed inherent racial biases within them, too. For example, when asked "since learning about unconscious bias, in what way do you think that this might influence your practice?", one participant responded that one barrier was "when people of colour play the race card when they are being managed about their performance. People are not confident in how to challenge appropriately". This language reveals unconscious racial biases that may perpetuate racial inequalities by passing the blame onto racially minoritised students and staff themselves. When asked this same question, another participant responded that "I also think there is a risk that it may have a negative effect on my

under[st]anding of different cultures as I am less likely to ask staff questions about differences in cultures in case this is perceived to be micro aggressions". Although there were only a few instances of such responses, we include them here to highlight finer nuances around the effectiveness of URBT and the need for continued education to eradicate bias. Additional follow-up sessions after the training would be fruitful to explore participant's responses further and dismantle any misunderstandings.

## Conclusions

The degree awarding gap between racially minoritised students and their White peers is well documented within U.K universities and these students continue to experience prejudice and discrimination within the higher education and healthcare environment. The current study represents a coordinated effort between the NHS and higher education sector to evaluate the effectiveness of URBT to improve the experiences of racially minoritised students. Our findings indicate that such training may be a useful component of wider racial equality initiatives to increase knowledge, perceptions and awareness of racial bias and lead to a process of reflection and change. One-month later, qualitative themes suggest that participants had increased self-awareness of how they perceive and treat racially minoritised students and staff and were exploring how to set up mentoring and working groups, change recruitment and progression processes, and diversify the taught curriculum.

Although this study highlights the potential effectiveness of URBT, we emphasise that it is not a panacea. Instead, a multi-pronged approach is required that treats URBT as one element of a comprehensive and continually evaluated strategy to achieve racial equality. Effectively tackling the degree awarding gap requires a shift away from relying upon a deficit model to explain differences between racially minoritised students and their White peers to greater critical awareness of the structural and institutional factors that perpetuate racism (1,32). Furthermore, open and honest conversations about racism are essential outside of URBT

to ensure indefinite, positive change (27). Individuals, institutions, and organisations must take an anti-racist approach, demonstrating that they are actively combatting systemic inequalities and structural injustice (60). The NHS have outlined their commitment to addressing racial inequalities through the WRES report (14), NHS People Plan (15), and Race and Health Observatory (16,17). However, we argue that it is important that the degree awarding gap is also addressed within these strategies to ensure that racially minoritised students receive equitable education and placement experiences. This will allow the NHS to meet its goal of being a fully inclusive, equitable and fair employer (14).

**Contributions:** This contributor statement was informed by the CRediT taxonomy (https://credit.niso.org/). Conceptualization: CRP, EB, AA; Data curation: CRP; Formal analysis; CRP: Funding acquisition: CRP, EB, AA, MB, MPM; Investigation: EB, AA; Methodology: CRP; Project administration: EE, AA, MB; Resources: CRP, EB, AA; Software: CRP, EB, AA; Supervision: MPM, MB; Validation: CRP, MPM; Visualisation: CRP; Writing – original draft: CRP; Writing – review & editing: CRP, EB, AA, MPM, MB.

**Funding:** The work was supported by a Health Education England (HEE) grant (reference: EHAS0025). The funder had no role in the design and conduct of the study, the analyses, or their interpretation, nor the decision to prepare and submit the manuscript for publication.

**Competing Interests:** The authors declare no competing interests.

**Ethics Approval:** Ethical approval was granted by the lead research institute (REF: HAS.20.02.136) and all participants provided informed written consent.

**Data Availability & Transparency Statement:** The design and analysis plan were preregistered (https://osf.io/5w8fc). All materials, anonymised data, and analysis syntax are publicly available, as well as a statement outlining any necessary deviations to the preregistration protocol (https://osf.io/yfa6s/).

## References

1. NUS & Universities UK. Black, Asian, and Minority Ethnic student attainment at UK universities: #closingthegap [Internet]. 2019. Available from: https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2019/bame-student-attainment-uk-universities-closing-the-gap.pdf

2. Higher Education Statistics Agency [HESA]. What are HE students' progression rates and qualifications? [Internet]. 2019. Available from: https://www.hesa.ac.uk/data-and-analysis/students/outcomes

3. Stevenson J, O'Mahony J, Khan O, Ghaffar F, Stiell B. Understanding and overcoming the challenges of targeting students from under-represented and disadvantaged ethnic backgrounds. Report to the Office for Students [Internet]. 2019. Available from: https://www.officeforstudents.org.uk/media/d21cb263-526d-401c-bc74-299c748e9ecd/ethnicity-targeting-research-report.pdf

4. Public Health England. Disparities in the risk and outcomes of COVID-19. [Internet]. 2020. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf

5. Lawton L, McRae M, Gordon L. Frontline yet at the back of the queue: Improving access and adaptations to CBT for Black African and Caribbean communities. Cogn Behav Ther. 2021;14(1):1–19. Available from: https://doi.org/10.1017/S1754470X21000271

6. MBRRACE. Saving lives, improving mothers' care: Lessons learned to inform maternity care from the UK and Ireland confidential enquiries into maternal deaths and

morbidity 2014–16 [Internet]. Maternal, Newborn and Infant Clinical Outcome Review Programme. 2018. Available from: https://www.npeu.ox.ac.uk/assets/downloads/mbrrace-uk/reports/MBRRACE-UK Maternal Report 2018 - Web Version.pdf

7. Yaya S, Yeboah H, Charles CH, Otu A, Labonte R. Ethnic and racial disparities in COVID-19-related deaths: Counting the trees, hiding the forest. BMJ Glob Heal. 2020;5(6):1–5. Available from: http://dx.doi.org/10.1136/bmjgh-2020-002913

8. Appleby J. Ethnic pay gap among NHS doctors. The BMJ. 2018;362:k3586. Available from: https://doi.org/10.1136/bmj.k3586

9. Atewologun D, Kline R, Ochieng M. Fair to refer? Reducing disproportionality in fitness to practise concerns reported to the GMC [Internet]. General Medical Council. 2019. Available from: https://www.gmc-uk.org/-/media/documents/fair-to-refer-report_pdf-79011677.pdf

10. Milner A, Baker E, Jeraj S, Butt J. Race-ethnic and gender differences in representation within the English National Health Service: A quantitative analysis. BMJ Open. 2020;10(2):1–6. Available from: http://dx.doi.org/10.1136/bmjopen-2019-034258

11. Royal College of Nursing. Second person protective equipment survey of UK Nursing staff report: Use and availability of PEE during the COVID-19 pandemic. [Internet]. 2020. Available from: https://www.rcn.org.uk/professional-development/publications/rcn-second-ppe-survey-covid-19-pub009269

12. Adebowale V, Rao M. Racism in medicine: why equality matters to everyone. The BMJ. 2020;368:m530. Available from: https://doi.org/10.1136/bmj.m530

13. Iacobucci G. Specialty training: ethnic minority doctors' reduced chance of being appointed is "unacceptable." The BMJ. 2020;368:m479. Available from: http://dx.doi.org/doi:10.1136/bmj.m479

14. WRES Implementation Team. 2020 data analysis report for NHS trusts and clinical commissioning groups [Internet]. 2021. Available from: https://www.england.nhs.uk/wp-content/uploads/2021/02/Workforce-Race-Equality-Standard-2020-report.pdf

15. NHS England. We ARE THE NHS: People Plan for 2020/2021-action for us all [Internet]. 2020. Available from: https://www.england.nhs.uk/publication/we-are-the-nhs-people-plan-for-2020-21-action-for-us-all/

16. Kmietowicz Z. NHS launches Race and Health Observatory after BMJ's call to end inequalities. The BMJ. 2020;369:m2191. Available from: http://dx.doi.org/doi:10.1136/bmj.m2191

17. Naqvi H, Gabriel M, Adebowale V. The critical role of the NHS Race and Health Observatory. BMJ Lead. 2022;6(2):130–1. Available from: https://doi.org/10.1136/leader-2021-000505

18. Cabinet Office. Race Disparity Audit: Summary findings from the ethnicity facts and figures website [Internet]. 2018. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/686071/Revised_RDA_report_March_2018.pdf

19. Equality and Human Rights Commission. Tackling racial harassment: Universities challenged [Internet]. 2019. Available from: https://www.equalityhumanrights.com/en/publication-download/tackling-racial-harassment-universities-challenged

20. Smith S. Exploring the Black and Minority Ethnic (BME) student attainment gap: What did it tell us? Actions to address home BME undergraduate students' degree attainment. JPAAP. 2017; 5: 48–57. Available from: https://doi.org/10.14297/jpaap.v5i1.239

21. Stevenson J. An exploration of the link between Minority Ethnic and White students' degree attainment and views of their future 'possible selves'. High Educ Stud. 2012;2(4):103–13. Available from: http://dx.doi.org/10.5539/hes.v2n4p103

22. Stevenson J, O'Mahony J, Khan O, Ghaffar F, Stiell B. Understanding and overcoming the challenges of targeting students from under-represented and disadvantaged ethnic backgrounds Report to the Office for Students. 2019. Available from: https://www.officeforstudents.org.uk/media/d21cb263-526d-401c-bc74-299c748e9ecd/ethnicity-targeting-research-report.pdf

23. MIND. Racism and mental health [Internet]. 2020. Available from: https://www.mind.org.uk/information-support/tips-for-everyday-living/racism-and-mental-health/

24. Williams MT. Microaggressions: Clarification, evidence, and impact. Perspect Psychol Sci. 2020;15(1):3–26. Available from: https://doi.org/10.1177/1745691619827/499

25. Ackerman-Barger K, Boatright D, Gonzalez-Colaso R, Orozco R, Latimore D. Seeking inclusion excellence: Understanding racial microaggressions as experienced by underrepresented medical and nursing students. Acad Med. 2020;95(5):758–63. Available from: https://doi.org/10.1097/acm.0000000000003077

26. Neves J, Hillman N. The 2016 Student Academic Experience Survey. High Educ Policy Inst [Internet]. 2017;4–28. Available from: https://www.hepi.ac.uk/wp-content/uploads/2016/06/Student-Academic-Experience-Survey-2016.pdf

27. Pryce-Miller M, Bliss E, Airey A, Garvey A, Pennington CR. The lived experiences of racial bias for Black, Asian, and Minority Ethnic students in practice: A hermeneutic phenomenological study. Nurse Educ Pract. 2022: 103532. Available from: https://doi.org/10.1016/j.nepr.2022.103532

28. Williams MT, Kanter JW, Ching THW. Anxiety, stress, and trauma symptoms in African Americans: Negative affectivity does not explain the relationship between microaggressions and psychopathology. J Racial Ethn Heal Disparities. 2018;5(5):919–27. Available from: https://doi.org/10.1007/s40615-017-0440-3

29. Godbold R, Brathwaite B. Minding the gap. Improving the Black Asian and Minority Ethnic student awarding gap in pre-registration adult nursing programmes by decolonizing the curriculum. Nurse Educ Today. 2021;98: 2020–2. Available from: https://doi.org/10.1016/j.nedt.2020.104667

30. Scammell JME, Olumide G. Racism and the mentor-student relationship: Nurse education through a white lens. Nurse Educ Today. 2012;32(5):545–50. Available from: http://dx.doi.org/10.1016/j.nedt.2011.06.012

31. Kmietowicz Z. Are medical schools turning a blind eye to racism? The BMJ. 2020;368. Available from: https://doi.org/10.1136/bmj.m420

32. Bhopal K, Pitkin C. 'Same old story, just a different policy': Race and policy making in higher education in the UK. Race Ethn Educ. 2020;23(4):530–47. Available from: https://doi.org/10.1080/13613324.2020.1718082

33. Morgan Consoli ML, Marin P. Teaching diversity in the graduate classroom: The instructor, the students, the classroom, or all of the above? J Divers High Educ. 2016;9(2):143–57. Available from: https://psycnet.apa.org/doi/10.1037/a0039716

34. WRES Implementation Team. A model employer: Increasing Black and Minority Ethnic representation at senior levels across the NHS [Internet]. *NHS Workforce Race Equality Standard (WRES) leadership strategy* 2019. Available from: https://www.england.nhs.uk/wp-content/uploads/2019/01/wres-leadership-strategy.pdf

35. Bhatia S. Decolonizing psychology: Globalization, social justice, and Indian youth identities. Oxford University Press; 2017.

36. Gillborn S, Woolnough H, Jankowski G, Sandle R. "Intensely white": psychology curricula and the (re)production of racism. Educ Rev. 2021;00(00):1–20. Available from: https://doi.org/10.1080/00131911.2021.1978402

37. Peters MA. Why is my curriculum white? A brief genealogy of resistance. In: Arday J, Mirza, HS, editors. Dismantling race in Higher Education. Palgrave Macmillan; 2018. p. 253–70.

38. Dover TL, Kaiser CR, Major B. Mixed signals: The unintended effects of diversity initiatives. Soc Issues Policy Rev. 2020;14(1):152–81. Available from: https://doi.org/10.1111/sipr.12059

39. Kaiser CR, Dover TL, Small P, Xia G, Brady LM, Major B. Diversity initiatives and White Americans' perceptions of racial victimhood. Personal Soc Psychol Bull. 2022;48(6):968–84. Available from: https://doi.org/10.1177%2F01461672211030391

40. Ledgerwood A, Hudson S kiera TJ, Lewis NA, Maddox KB, Pickett CL, Remedios JD, et al. The pandemic as a portal: Reimagining psychological science as truly open and inclusive. Perspect Psychol Sci. 2022;17(4):937–59. Available from: https://doi.org/10.1177%2F17456916211036654

41. Watt SK. Moving beyond the talk: From difficult dialogues to action. In: Armino J,

Torres V, Pope R, editors. Why aren't we there yet: Taking personal responsibility for creating an inclusive campus. Stylus Publishing; 2011.

42. Atewologun D, Cornish T, Tresh F. Unconscious bias training: An assessment of the evidence for effectiveness [Internet]. Equality & Human Rights Commission; 2018. Available from: https://www.equalityhumanrights.com/sites/default/files/research-report-113-unconcious-bais-training-an-assessment-of-the-evidence-for-effectiveness-pdf.pdf

43. Equality Challenge Unit. Unconscious bias and higher education. Equal Chall Unit [Internet]. 2013;99. Available from: https://diversity.caltech.edu/documents/19785/unconscious-bias-and-higher-education-compressed.pdf

44. Carnes M, Devine PG, Isaac C, Manwell LB, Ford CE, Byars-Winston A, et al. Promoting institutional change through bias literacy. J Divers High Educ. 2012;5(2):63–77. Available from: https://doi.org/10.1037/a0028128

45. Forscher PS, Mitamura C, Dix EL, Cox WTL, Devine PG. Breaking the prejudice habit: Mechanisms, timecourse, and longevity. J Exp Soc Psychol. 2017 Sep 1;72:133–46. Available from: https://doi.org/10.1016/j.jesp.2017.04.009

46. Behavioural Insights Team. Unconscious bias and diversity training-what the evidence says. Government Equalities Office. 2020; 91. Available from: https://www.bi.team/wp-content/uploads/2020/12/20-12-14-Unconscious-Bias-Training-BIT-report-1.pdf

47. Carter ER, Onyeador IN, Lewis NA. Developing & delivering effective anti-bias training: Challenges & recommendations. Behav Sci Policy. 2020;6:57–70. Available from: https://doi.org/10.1353/bsp.2020.0005

48. [dataset] Pennington CR, Bliss E, Airey A, Bancroft B, Pryce-Miller M. Data from: A mixed methods evaluation of unconscious racial bias training for NHS senior practitioners to improve the experiences of racially minoritised students. Open Science Framework: https://doi.org/10.17605/OSF.IO/YFA6S

49. Bell B. Pretest–posttest design. In: Salkind NJ, editor. Encyclopedia of research design. SAGE Publications Inc.; 2010. p. 1087–91.

50. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav. Res. Methods. 2007; 39: 175–192. Available from: https://doi.org/10.3758/bf03193146

51. National Women's Council of Ireland. Recognising and challenging our unconscious bias: Sample training pack. [Internet]. 2015. Available from: http://www.nwci.ie/images/uploads/NWCI_Training_Pack_Final.pdf

52. Hausmann LRM, Burgess DJ, Frankenfield L, Long JA, Mor MK, Obrosky DS, et al. Evaluation of a pilot program to improve patient health care experiences through PACT cultural competency training about unconscious bias [Internet]. 2014. Available from: https://www.researchgate.net/publication/301625572

53. Girod S, Fassiotto M, Grewal D, Ku MC, Sriram N, Nosek BA, et al. Reducing implicit gender leadership bias in academic medicine with an educational intervention. Acad Med. 2016; 91: 1143–1150. Available from: https://doi.org/10.1097/acm.0000000000001099

54. IBM Corp. IMB Statistics for Windows. 2019. Version 26.0.

55. Tabachnick, B. G., & Fidell LS. Using multivariate statistics. 6th ed. Pearson Education Ltd.; 2013.

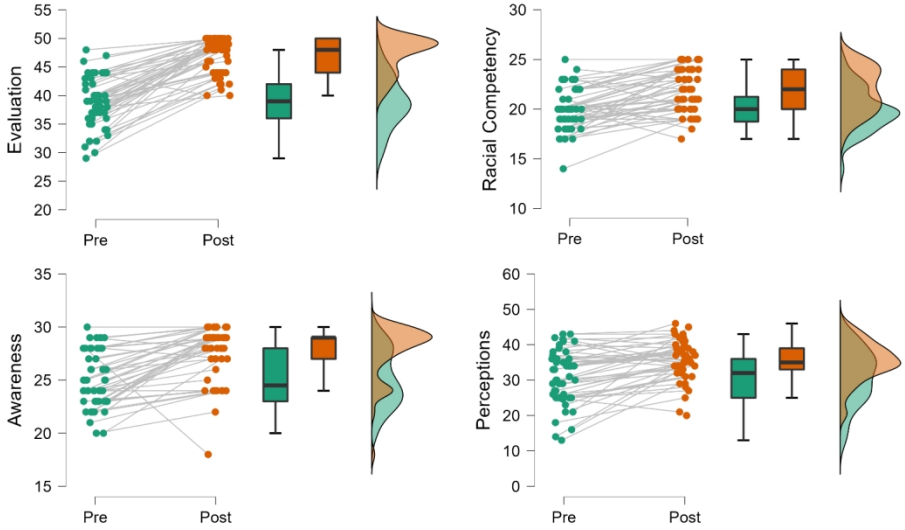
56. Braun V, Clarke V. Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. Couns Psychother Res. 2021;21(1):37–47. Available from: https://doi.org/10.1002/capr.12360

57. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3(2):77–101. Available from: https://doi.org/10.1191/1478088706qp063oa

58. Bezrukova K, Spell CS, Perry JL, Jehn KA. A meta-analytical integration of over 40 years of research on diversity training evaluation. Psychol Bull. 2016;142(11):1227–74. Available from: https://doi.org/10.1037/bul0000067

59. Kanter JW, Rosen DC, Manbeck KE, Branstetter HML, Kuczynski AM, Corey MD, et al. Addressing microaggressions in racially charged patient-provider interactions: A pilot randomized trial. BMC Med Educ. 2020;20(1):1–14. Available from: https://doi.org/10.1186/s12909-020-02004-9

60. Williams MT, Faber SC, Duniya C. Being an anti-racist clinician. Cogn Behav Ther. 2022;15(2). Available from: https://doi.org/10.1017/S1754470X22000162




A raincloud plot displaying pre- to post-training changes in training evaluations, racial competency, awareness, and perceptions of unconscious racial bias. Left = individual data points from pre- to post-training, middle = interquartile range and confidence intervals, right = data distribution.

145x85mm (300 x 300 DPI)

# Reporting checklist for randomised trial.

Based on the CONSORT guidelines.

## Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the CONSORTreporting guidelines, and cite them as:

Schulz KF, Altman DG, Moher D, for the CONSORT Group. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials

| | | Reporting Item | Page Number |
|---|---|---|---|
| **Title and Abstract** | | | |
| Title | #1a | Identification as a randomized trial in the title. | N/A: Empirical study (preregisered) not an RCT |
| Abstract | #1b | Structured summary of trial design, methods, results, and conclusions | 2 |
| **Introduction** | | | |

| | | | |
|---|---|---|---|
| Background and objectives | #2a | Scientific background and explanation of rationale | 8-9 |
| Background and objectives | #2b | Specific objectives or hypothesis | 8-9 |
| **Methods** | | | |
| Trial design | #3a | Description of trial design (such as parallel, factorial) including allocation ratio. | 10 |
| Trial design | #3b | Important changes to methods after trial commencement (such as eligibility criteria), with reasons | 10 |
| Participants | #4a | Eligibility criteria for participants | 10 |
| Participants | #4b | Settings and locations where the data were collected | 11 |
| Interventions | #5 | The experimental and control interventions for each group with sufficient details to allow replication, including how and when they were actually administered | 10-12 |
| Outcomes | #6a | Completely defined prespecified primary and secondary outcome measures, including how and when they were assessed | 12-14 |

| | | | |
|---|---|---|---|
| Sample size | #7a | How sample size was determined. | 10 |
| Sample size | #7b | When applicable, explanation of any interim analyses and stopping guidelines | N/A |
| Randomization - Sequence generation<br><br>N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. | #8a | Method used to generate the random allocation sequence. | |
| Randomization - Sequence generation<br><br>N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. | #8b | Type of randomization; details of any restriction (such as blocking and block size) | |
| Randomization - Allocation concealment mechanism | #9 | Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were | N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. |

| | | | |
|---|---|---|---|
| | | assigned | |
| Randomization - Implementation | #10 | Who generated the allocation sequence, who enrolled participants, and who assigned participants to interventions | N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation. |
| Blinding | #11a | If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how. | 9 |
| Blinding | #11b | If relevant, description of the similarity of interventions | N/A |
| Statistical methods | #12a | Statistical methods used to compare groups for primary and secondary outcomes | 14-15 |
| Statistical methods | #12b | Methods for additional analyses, such as subgroup analyses and adjusted analyses | 14-15 |
| Outcomes | #6b | Any changes to trial outcomes after the trial commenced, with reasons | 10 |
| **Results** | | | |
| Participant flow diagram (strongly recommended) | #13a | For each group, the numbers of participants who were randomly | N/A: Pre-post repeated measures design |

| | | | |
|---|---|---|---|
| | | assigned, received intended treatment, and were analysed for the primary outcome | |
| Participant flow | #13b | For each group, losses and exclusions after randomization, together with reason | 10 |
| Recruitment | #14a | Dates defining the periods of recruitment and follow-up | 14 |
| Recruitment | #14b | Why the trial ended or was stopped | N/A |
| Baseline data | #15 | A table showing baseline demographic and clinical characteristics for each group | 15-18 AND FIGURE 1 |
| Numbers analysed | #16 | For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups | 15-18 |
| Outcomes and estimation | #17a | For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval) | 15-18 |
| Outcomes and estimation | #17b | For binary outcomes, presentation of both absolute and relative effect sizes is recommended | N/A |
| Ancillary analyses | #18 | Results of any other analyses performed, | 15-18 |

| | | | |
|---|---|---|---|
| | | including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory | |
| Harms | #19 | All important harms or unintended effects in each group (For specific guidance see CONSORT for harms) | 24 |
| **Discussion** | | | |
| Limitations | #20 | Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses | Throughout Discussion: 21-25 |
| Interpretation | #22 | Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence | 21-25 |
| Registration | #23 | Registration number and name of trial registry | 10 |
| Generalisability | #21 | Generalisability (external validity, applicability) of the trial findings | 21-25 |
| **Other information** | | | |
| Interpretation | #22 | Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence | 21-25 |
| Registration | #23 | Registration number and name of trial registry | 10 |

| | | | |
|---|---|---|---|
| Protocol | #24 | Where the full trial protocol can be accessed, if available | 10 |
| Funding | #25 | Sources of funding and other support (such as supply of drugs), role of funders | 1 |

Notes:

- 1a: N/A: Empirical study (preregisered) not an RCT
- 8a: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 8b: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 9: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 10: N/A: oppurtunity sampling, pre-post repeated measures design, no randomisation.
- 13a: N/A: Pre-post repeated measures design
- 15: 15-18 AND FIGURE 1
- 20: Throughout Discussion: 21-25 The CONSORT checklist is distributed under the terms of the Creative Commons Attribution License CC-BY. This checklist was completed on 30. September 2022 using https://www.goodreports.org/, a tool made by the EQUATOR Network in collaboration with Penelope.ai